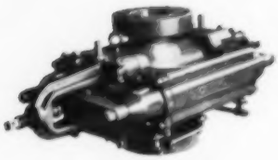
FIVE DOLLARS PER YEAR • ONE DOLLAR PER COPY

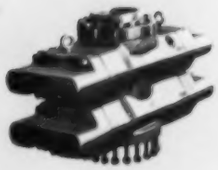
World Petroleum

25 YEARS OF SERVICE TO THE INTERNATIONAL PETROLEUM INDUSTRY **AUGUST 1955**

MEN AND METHODS NEED THE BEST EQUIPMENT FOR THE BEST RESULTS



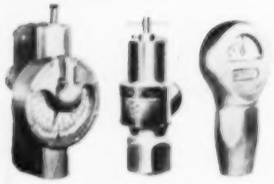
QRC PRESSURE OPERATED
BLOWOUT PREVENTERS



SS PRESSURE OPERATED
BLOWOUT PREVENTERS

HCR PRESSURE OPERATED
FLOWLINE GATE VALVES

FLEX-SEAL MUD VALVES



WEIGHT INDICATORS
SHEAR RELIEF VALVES
MUD LINE PRESSURE GAUGES

COMPLETE WELL HEAD
EQUIPMENT AND VALVES

PRODUCTION CHOKES

SAFETY XMAS TREES

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IRON WORKS, INC.
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Unique

"Newallastic" bolts and studs have qualities which are absolutely unique. They have been tested by every known device, and have been proved to be stronger and more resistant to fatigue than bolts or studs made by the usual method.

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Over
50
Locations in the United States and Canada

McCullough REPORTS
TO THE OIL INDUSTRY

Service
Anywhere Anytime

New Services • • • New Tools • • • New Methods • • • Outstanding Results

Accuracy of McCullough Scintillation Counter Shown by Sharp Definition of Thin Beds

The McCullough Radiation Well Logger utilizes a very sensitive radiation detector—the highly efficient McCullough Scintillation Counter. It is a dense, transparent body that converts gamma rays and the energy from neutrons into light, called "scintillations."

This scintillation counter has an efficiency approaching 100% in its ability to detect radiation. Because of this efficiency the counter need only have an effective length of from 2 to 3 inches. Therefore, it will sharply define lithologic boundary changes and will clearly define thin beds.

A striking example of this efficiency is demonstrated by the following field report on a series of logs run in numerous wells in a Canadian oil field.

At one end of the field the main sand is water loaded except for top streaks. This top sand is about 12 inches thick with thin lenses of sand and shale over it. Usually a single string of 5½" casing is set through the pay zone which lies at approximately 3200'.

The perforator is positioned from McCullough Gamma Ray Log measurements and a simultaneous collar log. Usually one to three feet of zone are perforated with eight holes per foot. Shooting just a few inches too high means no production—a few inches too low results in water and hazardous squeezing operations.

The fine detail and extreme accuracy of the McCullough Log accurately pin points the thin sands for successful completion.

McCullough Radiation Well Log Finds Casing Set Too Low

Helps Turn a Three Year Old Abandonment Into a Profitable Completion

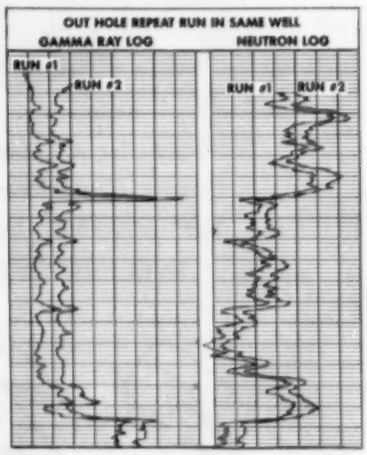
Converting an abandoned well into a flowing one was the subject of a recent job report from a McCullough Wyoming Branch Manager.

This well had been drilled about three years ago and had never been a producer. 5½" O.D. casing had supposedly been set on top of a sand formation that looked promising.

McCullough ran a Radiation Log to total depth and found that the casing had actually been set within six inches of the bottom of the sand. Nearly all the productive area had been cased off.

Using a combination of M-3 Bullet Guns and Super Casing Glass Jets, 120 holes were shot through the casing in a 15 foot interval at 3655'. The well started flowing immediately after perforating and has continued to be a good producer.

Jobs like this, where a total loss has been changed to a profitable completion, are a tribute to the extreme accuracy and efficiency of the McCullough Radiation Well Logger. However, equal credit for the production obtained must be given to the deeper penetrating abilities of McCullough Perforators.



Stability is an important characteristic of the McCullough Radiation Well Logger. It will faithfully duplicate results when run repeatedly under identical conditions. The curves above were made on successive runs in the same well and then placed side by side to show consistency and repeatability.

McCullough® TOOL COMPANY

Cable Address: MACTOOL

LOS ANGELES
HOUSTON
EDMONTON

WORLD PETROLEUM for August, 1955. Vol. 26, No. 9, August, 1955. WORLD PETROLEUM is published monthly by Mona Palmer, Trustee under the will of Russell Palmer, 604 Fifth Ave., New York 20, N. Y. Acceptance under Section 34.64 P.L.&R. pending at Bristol, Conn. Subscription rate: $5.00 per year, single copies $1.00. Copyright 1955, by Mona Palmer, Trustee.

INDIA — At Bombay's Santa Cruz Airport, a Caltex crew refuels one of TWA's sleek Constellations, a unit of the world's largest fleet of Connies and Super Constellations. Travelers depend on TWA for speed, comfort and safety... just as TWA calls on Caltex for fuels, lubricants and service that assure dependable engine performance and lower maintenance costs.

CALTEX serves the people of 67 lands

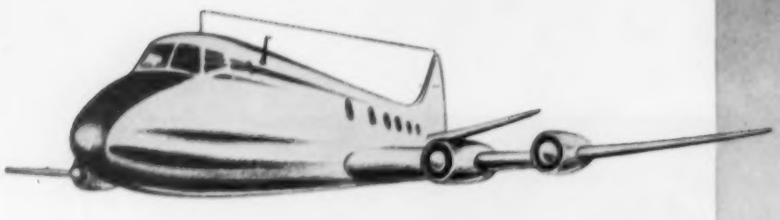
In 67 lands, across half the world, through such developments as these, Caltex supplies better fuels and lubricants for industry, for agriculture and for motoring millions. These require a continual investment of funds and skills, backed by a faith in a better future for free nations.

Petroleum Products

SERVING EUROPE • AFRICA • ASIA • AUSTRALIA • NEW ZEALAND

BAHRAIN — This modern service station is a busy "oasis" in the colorful Persian Gulf shaikhdom of Bahrain. Nearby, the Bapco refinery brings employment to many Bahrainis, assures a brighter economic future, produces petroleum products for markets halfway 'round the world.

ENGLAND — Big Ben is a familiar landmark in the world's largest city. Well known also is the lorry of the Regent Oil Company, Ltd. This Caltex affiliate in the United Kingdom supplies fine petroleum products so essential to progress.



Up to the minute servicing—thanks to...

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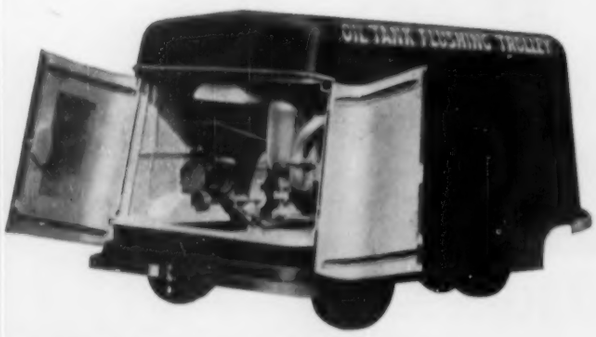
REFUELLING UNITS

give maximum efficiency in the minimum of time.

For overwing or pressure refuelling. Flow rates up to 600 G.P.M. Controlled line pressure. Fine particle filtration degree 2½ microns. Line flow controller. Patent overhead Boom Gear. Power operated Hose Reels.

TROLLEYS *for flushing, replenishing, de-icing, methanol, coolant*

Generally of 100 Gallons Capacity, the Zwicky Trolleys are complementary to their Aircraft Refuelling Units and the range covers all airport requirements such as Water Methanol, Oil System Flushing, Replenishing, De-Icing and Fresh Water Services. To B.O.T. requirements if specified.



We invite you to inspect our equipment at the
FARNBOROUGH AIR DISPLAY
Stand No. 284

SPECIALISTS IN EQUIPMENT FOR BULK STORAGE INSTALLATIONS

ZWICKY LTD.
Trading Estate, Slough, Bucks.

There's not enough food for you and the bugs

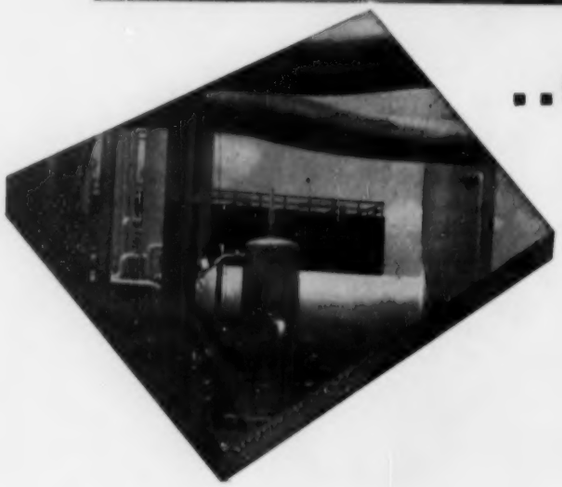
As any backyard gardener knows, you have a fight on your hands from the moment you turn over your first spadeful of earth. At every step, fungus growths, weeds, and insects that chew, insects that suck are waiting to destroy your lawns, trees, plants, flowers. It is a disheartening struggle for Greenthumbers . . . a round-the-clock fight for commercial farmers.

Fortunately, there's a growing list of weapons we now can wield in the battle against bugs. Some of the most effective have been developed in the laboratories of California Spray-Chemical Corporation, a Standard Oil Company of California subsidiary. In 1907, we brought out the first basic lead arsenate to stop the codling moth, a rampaging fruit crop destroyer; later, the invention of new-type summer and dormant oil sprays safely checked scale and other insects.

Other Standard research achievements have been chemicals to kill aphis, mites, thrips, and similar sucking insects . . . dusts to destroy fungus diseases like rust, blight, mildew...sprays and dusts custom-made to knock out such public enemies as the devastating grasshopper, boll weevil, hornworm. Other pest-killers boost milk production from our dairy herds, help beef cattle fatten faster.

One good reason you live in the world's best-fed nation is because insect invaders have been held back on our farms, ranches, and orchards, thanks in part to Standard's constant hunt for new ways to make petroleum do more things for you.

STANDARD OIL COMPANY OF CALIFORNIA *plans ahead to serve you better*



..only part of the picture

OIL REFINERY ENGINEERS know that Newalls bring more than materials to the site, because they realise that even first class insulation materials cannot do justice to themselves unless they are efficiently applied. In fact, the task of planning that the right materials are used is a job studied carefully by Newalls before their recommendations are submitted. Through consultation with Newalls you can make very certain that method as well as materials is brought to bear on the problem. That's maybe why Newalls record of refinery insulation jobs makes such an impressive picture.

RECENT CONTRACTS **Among the large petroleum projects to which Newalls have supplied insulation materials recently are the Anglo Iranian Oil Company's new refineries at Aden and Kwinana and also the new Brazilian State Refinery at Cubatao, Brazil.**

Where there's a HEAT INSULATION problem there's a job for **Newalls**

NEWALLS INSULATION CO. LTD. *Head Office:* Washington, Co. Durham, England. *A member of the* TURNER & NEWALL ORGANISATION
Offices and Depots at LONDON, GLASGOW, MANCHESTER, NEWCASTLE UPON TYNE, BIRMINGHAM, BELFAST, BRISTOL & CARDIFF *Agents and Vendors in most markets abroad*

PAVING THE WAY

Rolling a black carpet of asphalt across the desert was no easy chore. Battling the stern sand dune country, teams of Saudi Arab and American employees of the Arabian American Oil Company tackled some mighty unusual problems when they built the 24-mile stretch of highway between the oil communities of Dhahran and Abqaiq. Bulldozers, three abreast, rearranged 35-foot high dunes, shoving them shoulder to shoulder to form a long, continuous roadbed.

Aramco ARABIAN AMERICAN OIL COMPANY
DHAHRAN, SAUDI ARABIA · NEW YORK, N.Y., U.S.A.

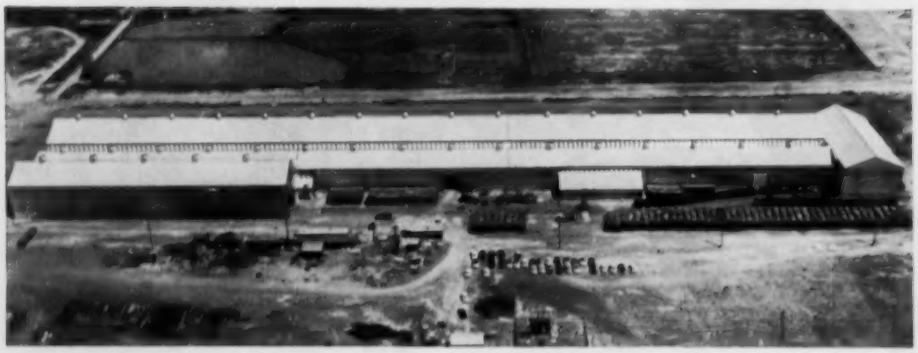
MILES OF HIGH TEST LINE

PIPE NOW ROLLING

FROM CONSOLIDATED WESTERN'S

NEW UTAH PLANT

From New "Hub of the West" Source, Trainloads of USS Quality 20"-36" High Test Line Pipe Are On The Way To Meet Pipeliners' Needs.



PRECISION PROCESS PIONEERED BY CONSOLIDATED WESTERN—assuring uniform diameter and wall thickness, plus greatest strength and service per ton of steel—steel plate is formed with giant "U-ing" and "O-ing" presses, electric-welded automatically inside and out, hydraulically expanded, end-faced, and then undergoes rigid test and inspection before delivery. At the Utah plant, Consolidated Western's controlled quality manufacturing methods result in the strong, ductile, uniform pipe needed to build the West's great projects.

Quality control plus 100 years of engineering and fabricating leadership have combined to make Consolidated Western Steel, division of United States Steel Corporation, your primary source of supply for high-test line pipe, structural steel, plate products, mechanical equipment.

CONSOLIDATED WESTERN STEEL

SALES OFFICES: LOS ANGELES, SAN FRANCISCO, FRESNO, BAKERSFIELD, CALIFORNIA; PHOENIX, ARIZONA; SEATTLE, WASHINGTON

DIVISION

USS

UNITED STATES STEEL

GOING PLACES *underground with Cities Service...*

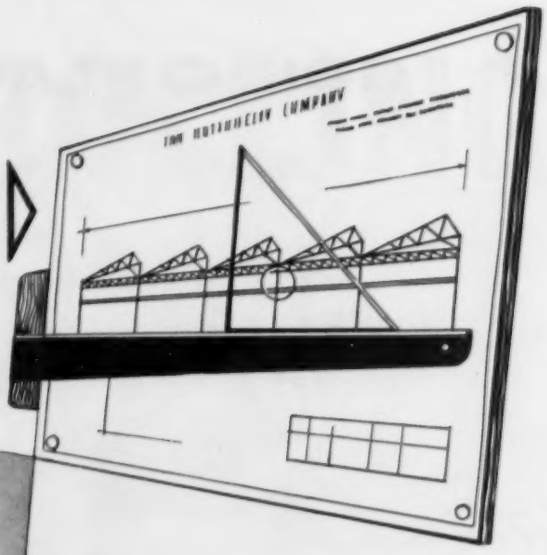
Cities Service transported more oil through more miles of pipeline in 1954 than ever before in Company history. Reason for this bustling underground activity—more Cities Service customers than ever before in Company history!

CITIES SERVICE

A Growth Company

Number 11 of a series

from drawing board



to erection on site

FOUNDED 1790

BUTTERLEY

Constructional Steelwork

The Butterley Company has been engaged in constructional steelwork from its early days and examples are to be found in all parts of the British Isles and in many countries overseas. From design, through the stages of fabrication to erection on site, every structure is invested with the skill and knowledge which have made the Butterley Company famous in the field of constructional steelwork. Welded methods are widely employed today and the shops are well-equipped to take the largest and heaviest work of this nature.

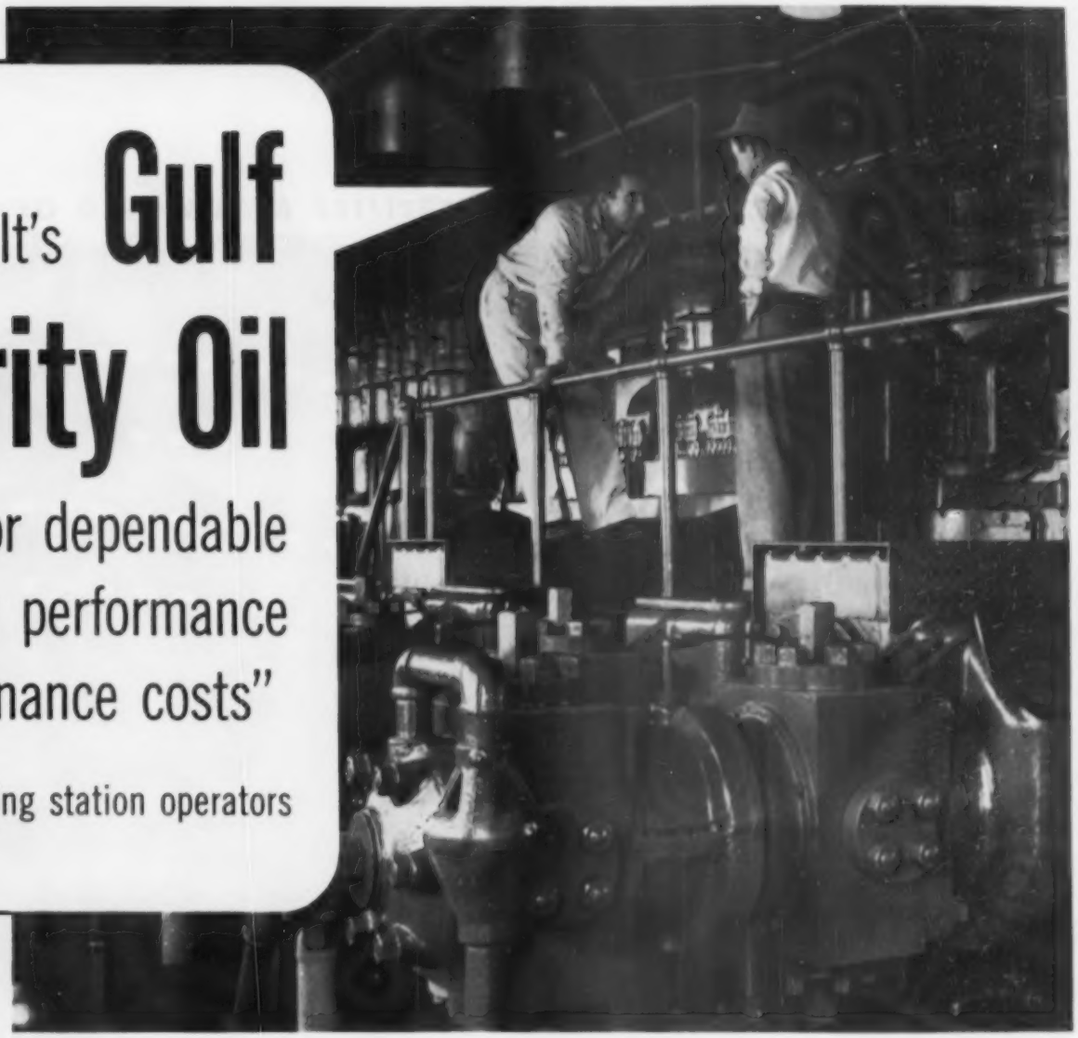
THE BUTTERLEY COMPANY LIMITED
RIPLEY, DERBY, ENGLAND
Tel.: RIPLEY 411 (9 lines)
LONDON OFFICE: 20 ASHLEY PLACE, VICTORIA, S.W.1. Tel.: VICTORIA 8023/4/5

Ca-37

"It's Gulf Security Oil

for dependable gas compressor performance and low maintenance costs"

say pumping station operators



Smooth, continuous operation is a must for these units in service at a South Texas gas compressor plant. They are responsible for the steady flow of essential natural gas through pipe lines to homes and industries as far north as Detroit and New York. Gulf Security Oil provides the sure, effective protection needed for cylinders and bearings in both engines and compressors.

You can depend on Gulf Security Oil to provide the proper lubrication that is so important to vital compressor units if operating troubles are to be prevented and maintenance costs kept low.

Gulf Security Oil has a record of outstanding performance in scores of gas transmission plants. After years of operation with this quality oil, the cylinders and piston rings of both the compressors and power assemblies show negligible wear. And few carbon deposits have formed on power cylinder ports and pistons.

If you are installing new compressor units, or feel that you're not getting the most effective lubrication possible for your present units, it will certainly pay you to try Gulf Security Oil. Contact your nearest Gulf Office and have a Gulf Sales Engineer call.

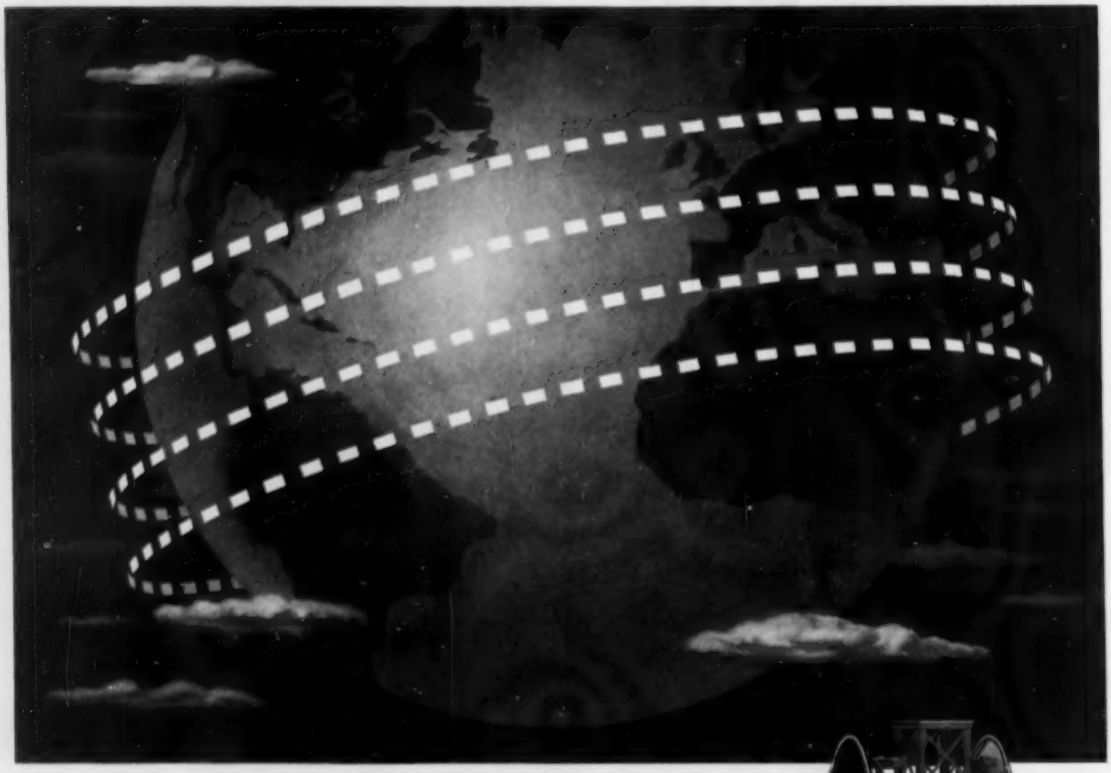
Gulf Oil Corporation • Gulf Refining Company

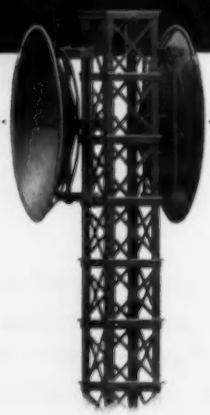
1822 GULF BUILDING, PITTSBURGH 30, PENNSYLVANIA

GULF

The finest petroleum products for your every need

FEDERAL MICROWAVE—"CERTIFIED BY A WORLD OF RESEARCH"





100,000 channel-miles is a lot of microwave experience

In 17 countries today... from Canada to Africa... from Sweden to Australia... multichannel microwave systems designed, manufactured, and installed by companies of International Telephone and Telegraph Corporation are serving government and industry... providing reliable communication over great distances... under all conceivable conditions of weather and terrain.

Consisting of links and networks, these vast and, for the most part, invisible communication facilities represent over 100,000 channel-miles, or more than four times the earth's equatorial circumference.

In this country alone, *Federal* Microwave provides tens of thousands of channel-miles... operated by pipelines, power utilities, telephone companies, municipalities, administrations, TV stations and others.

Designing and building multichannel microwave systems to meet the specialized circuitry requirements of such a wide variety of operations calls for experience... for engineering and manufacturing skill that has its roots in the pioneering days of microwave... for know-how that's *"Certified by a World of Research!"*

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A DIVISION OF

IT&T

Federal Telephone and Radio Company

A Division of INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

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Export Distributors: International Standard Electric Corp., 67 Broad St., New York

Leader in Lubrication

THEN

The first successful plane, developed by Wilbur and Orville Wright, took off December 17, 1903. On this famous flight *Mobiloil* protected the engine of the Wrights' tiny biplane.

Early racing champion, Ralph DePalma, drove to fame on old-time dirt tracks. In 1915 this two-time National AAA Winner set Indianapolis Race record of 89 mph *with Mobiloil!*

1909 Blue Ribbon Holder, H.M.S. Mauretania, held the North Atlantic speed record for 22 years. Like every Blue Ribbon winner since, she was protected by the *makers of Mobiloil!*

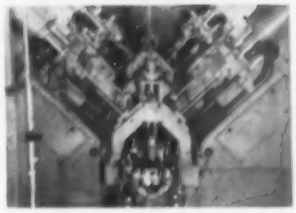
The first Diesel engine was developed in Germany in 1897. Rudolph Diesel, the inventor, solved his lubrication problem with special oils developed by the *makers of Mobiloil!*

NOW

Today's modern planes fly thousands of non-stop miles . . . travel coast to coast in hours. Socony Mobil helped make this rapid progress possible by continually developing the right fuels and lubricants.

1955 Indianapolis Winner, Bob Sweikert, averaged a sensational 128.209 mph to win this 500-mile classic. He relied on *Mobiloil* — first choice of more drivers than any other brand.

World's First Atomic Powered Submarine, the "Nautilus," is dramatic evidence of a new age. Socony Mobil supplied the Gargoyle Marine Oils that helped in the development and operation of this undersea marvel.



Modern industry's new trend— manufacture through automation— depends on precise hydraulic control. Majority of automated plants call on Socony Mobil's 89 years' experience.

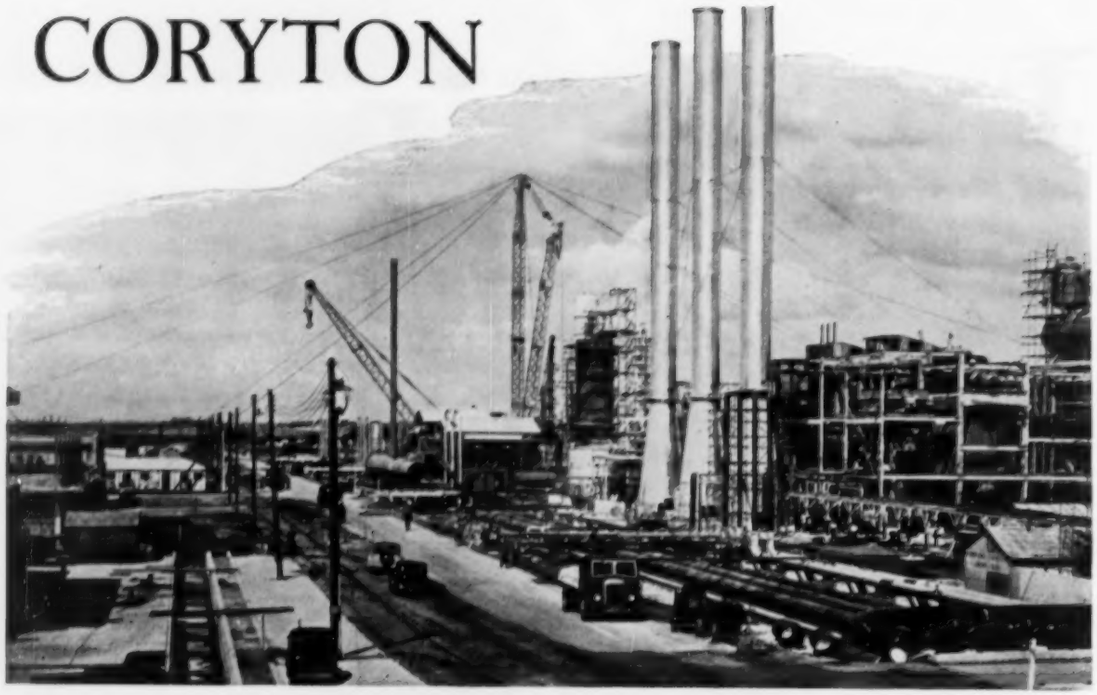
SOCONY MOBIL OIL COMPANY, INC.

Makers of

Mobiloil
World's Largest-Selling Motor Oil

Mobiloil Special
America's Most Popular Year-'round Motor Oil

CORYTON



VACUUM OIL COMPANY LIMITED, choose

Metropolitan–Vickers

Turbo-Generator Sets Three Metrovick 5,000 kW, pass-out type condensing turbo-generator sets are to be installed. The single cylinder turbines, which are supplied with steam at 600 psig 735° F., are so designed as to pass-out steam at 140 psig and 20 psig. Under certain conditions, provision is made for steam at 20 psig to be passed-in to the turbine.

Flameproof motors The M-V motors at Coryton include ten horizontal flameproof 2960 r.p.m. machines—four rated at 350 hp for the Propane De-asphalting plant, two at 200 hp for the Furfural unit and four at 200 hp for the M.E.K. plant. All these motors have ball and roller bearings with forced-feed oil lubrication from a gear-driven pump.

Non-Flameproof motors Two Metrovick 200 hp, 740 r.p.m., vertical motors were supplied for driving water pumps.
These motors (both flameproof and non-flameproof types) are squirrel-cage induction machines connected to a 3.3 kV three phase, 50 cycle supply.

METROPOLITAN-VICKERS
ELECTRICAL CO LTD · TRAFFORD PARK · MANCHESTER 17

Member of the A.E.I. group of companies

J/M205

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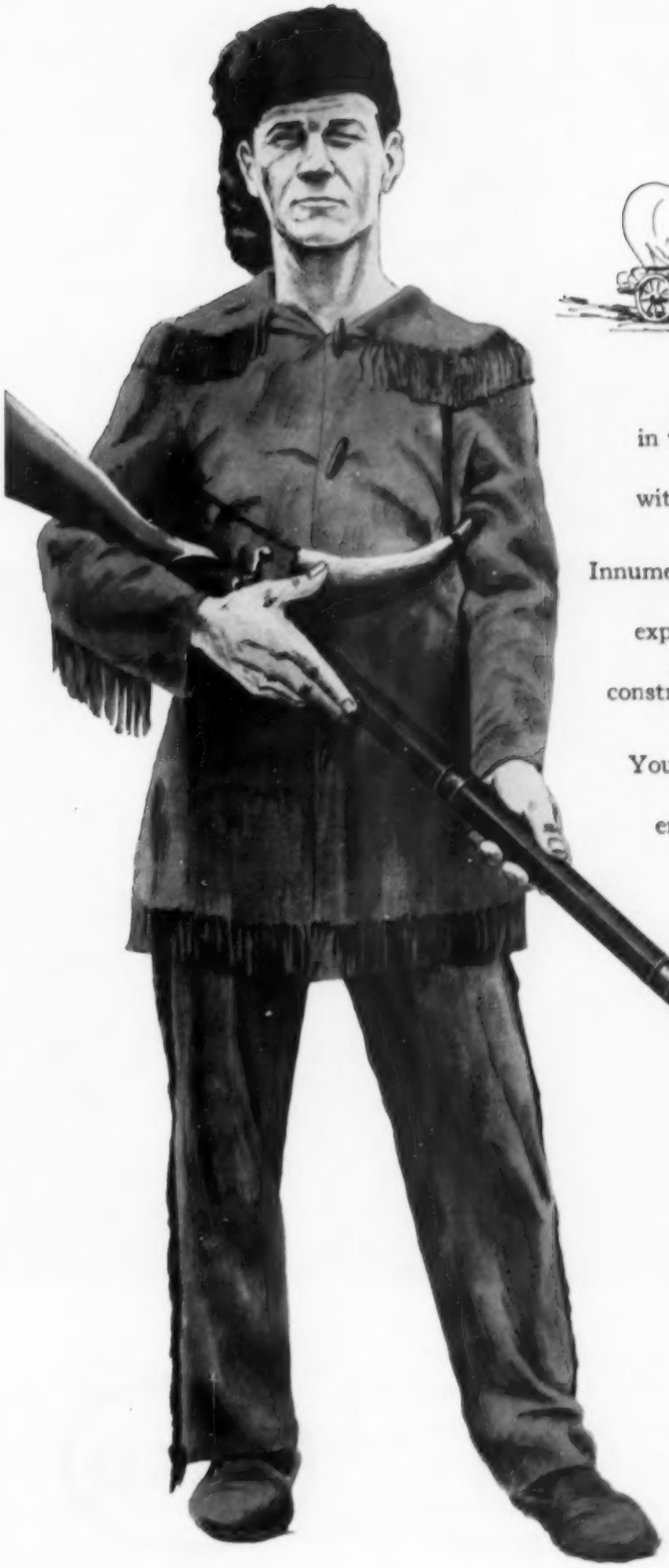

LEADING THE WAY

As they traveled through unfamiliar regions in their prairie schooners, the pioneer settlers of the western regions of America were faced with many uncertainties. For them, the journey was truly a voyage into the unknown.

Innumerable doubts and misgivings can be present, too, when you embark on an important expansion program, particularly when a decision must be reached on the selection of a process construction organization. There can be no turning back after the commitment becomes final.

You will be free of this concern when you choose Procon, with its complete design, engineering, and construction facilities. Procon has repeatedly demonstrated its leadership in completing a wide variety of projects according to the specified requirements.

Our engineering staff can show you in detail why your next process construction job should be handled by Procon.

PROCON *Incorporated*

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PROCON (CANADA) LIMITED—40 ADVANCE ROAD, TORONTO
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WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

PROCON

"The petroleum industry wants and supports sound highway expansion and improvement. Since we are in favor of all the roads that are needed and can reasonably be financed, we should interest ourselves in the problems of bringing them into actual existence. The wealth of talent and experience we have in this industry can make an important contribution to the solution of our highway and traffic difficulties."

— From an address by M. J. Rathbone, President, Standard Oil Company (New Jersey)

Esso

STANDARD OIL COMPANY (NEW JERSEY)

AND AFFILIATED COMPANIES

DU PONT

PETROLEUM CHEMICALS DIVISION

NEWS

DU PONT

August ★ One of a Series of Interest to the Petroleum Industry ★ 1955

THIS IS THE LATEST (No. 6) in Du Pont's series of dealer-education folders, entitled "looking through the windshield."

It tells the dealer – simply and clearly – how to turn "free" services such as windshield cleaning and tire pressure checking into profitable sales . . . by being on the alert to spot smooth tires, worn fan belts and rotted wiper blades.

It points out that the one service – oil check – which is considered *most important* by a big majority of motorists, is also one of the dealer's most profitable sales opportunities. And it clearly clinches the argument for "free" services by showing that, where services are given, the average gasoline purchase is greater by almost 2 gallons in volume and 55 cents per sale, than where the motorist receives no services.

This folder on services is the final one in the series. Others discuss (1) the customer himself, (2) "regular" and "premium" purchases, (3) credit, (4) motor oil buying habits, and (5) TBA purchases.

Any Du Pont Petroleum Chemicals Division representative or regional office will be glad to give you sample copies . . . and cost information on ordering the folders in quantities for your dealers.

Heating oils with FOA-2 have built-in promotion opportunities

As competition gets keener, you need new advantages to offer your ultimate customer – the heating oil user. And you can gain many customer advantages with Du Pont Fuel Oil Additive No. 2.

Du Pont FOA-2 acts as both a stabilizer and dispersant to retard the formation of insoluble residues and break up any residues that are formed. This greatly reduces clogging of filters, nozzles, screens and lines. In this way, it contributes greatly to cleaner, *more efficient* burner operation – an outstanding customer advantage.

Cuts service calls

By preventing clogged fuel systems, Du Pont FOA-2 helps to eliminate many service calls which might otherwise be a costly nuisance for both customers and distributors.

Its stabilizing action also means that you can assure your customer of *fresh* fuel throughout a long heating season – even though long storage periods are involved.

Advantages to refiner

With Du Pont Fuel Oil Additive No. 2, you can gain added refining and blending flexibility to meet peak seasonal demands for fuel oil on short notice. This is because it enables you to blend catalytic-cracked stocks with straight-run products. Thus, it also helps you release more of your straight-run

Continuing gum problem indicates need for constant guard against copper

In spite of the numerous steps refiners have taken to prevent it, metallic contamination of gasoline can still occur to an alarming degree. One Du Pont gasoline quality survey, for example, disclosed significant amounts of copper present in 91% of 241 gasoline samples from representative service stations in the U. S. and Canada. And the gasolines known to contain no metal deactivator were found to be high in gum content.

To safeguard your gasolines against the harmful effects of copper requires only about 1 pound of Du Pont Metal Deactivator per 1000 barrels. And in this low concentration, it costs you less than 1/5 of a cent per barrel to get this effective and important quality insurance.

THIS BOOKLET has all the information you will want about Du Pont Metal Deactivator. Full details on methods of addition, as well as product properties, are included. Ask any of our representatives or regional offices for a copy.

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

OVER

DU PONT

PETROLEUM CHEMICALS DIVISION
NEWS

DU PONT

CONTINUED

Heating Oils

stocks to meet demands for high quality diesel fuel.

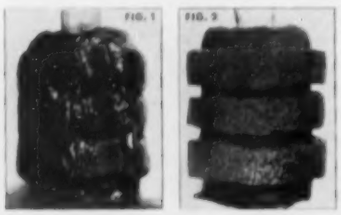
And for best results, FOA-2 should always be *added to freshly prepared stocks at the refinery.*

Low cost

Du Pont FOA-2 is effective in low concentrations – extremely economical to use. Many refiners have obtained excellent results with it at a treating cost of less than 2¢ per barrel. And when you consider the added flexibility and customer satisfaction it provides—combined with the elimination of many costly service calls – it more than pays for itself.

Promotion aid

To help you take advantage of the advertising and promotion opportunities of Du Pont FOA-2, our representatives will be glad to consult with you and provide a sample promotion built around a heating oil containing FOA-2.



Figs. 1 and 2 are representative of results obtained in a test conducted by a major oil company in an area where an abnormal number of sludge complaints in domestic heating systems were received.

Fig. 1 shows a typical filter element as removed from one of the heating units after running on untreated fuel. Fig. 2 shows an element at the end of a 90-day test period in which the same fuel plus Fuel Oil Additive No. 2 has been used in the system.

Try it!

Samples of Du Pont Fuel Oil Additive No. 2 for testing in your own stocks are readily available. And you can get complete information on it and methods of adding it from any Du Pont Petroleum Chemicals Division representative or regional office listed below.

AUTOMOTIVE TECHNOLOGIST

JOHN R. GRIFFIN, JR., a specialist in automotive and aviation fuels and lubricants, is currently working on the introduction of new additives developed by the Du Pont Petroleum Chemicals Division.

Most recently his activities have been concentrated on the introduction of the new Du Pont Lube Oil Additives 564 and 565. Prior to this assignment his specialty was additives for aviation fuels.

Before joining the Du Pont Company in 1950, Mr. Griffin was Chief Engineer at the Sharples Corporation's research laboratory at Bridgeport, Pa. There he was engaged in the development of centrifuges for classifying fine particles. His experience also includes six years with Trans World Airlines as Engineering Manager of aircraft maintenance and modification. Previous to this, he was a senior engineer at the Shell Development Company, working on the development of aircraft engine lubricants.

Mr. Griffin received his B.S. and M.S. degrees in Mechanical Engineering at the University of California in Berkeley. He is a member of the Society of Automotive Engineers, the American Society of Mechanical Engineers, and the Institute of Aeronautical Sciences.

Envelope Stuffer to Help Your Fuel Oil Distributors Simplify Their Service Problems

Efficient oil burner servicing always promotes good customer relations for your distributors. But when they have too many *needless* service calls, their profits suffer.

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The title is "What? No Heat!" The copy gives easy-to-understand-and-remember instructions on checking

such things as fuses, switches and the fuel level in the storage tank.

For sample copies and cost information on obtaining the stuffers in quantity for your distributors, contact any of our regional offices listed below.

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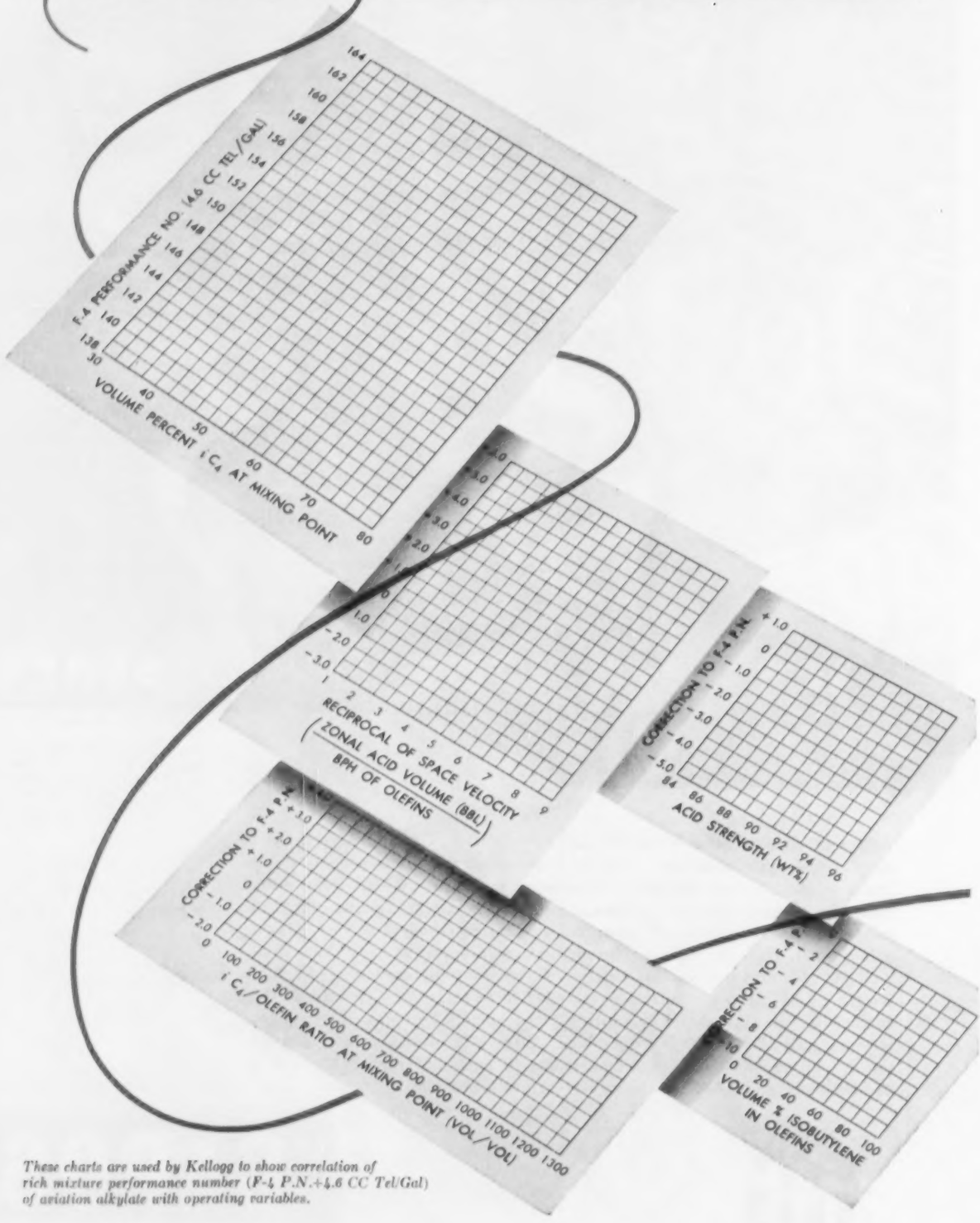
INSIDE TRACK IN THE OCTANE RACE...


F-4 PERFORMANCE NO. (4.6 CC TEL/GAL)
VOLUME PERCENT i C4 AT MIXING POINT
RECIPROCAL OF SPACE VELOCITY
(ZONAL ACID VOLUME (BBL)
BPH OF OLEFINS
CORRECTION TO F-4 P.N.
ACID STRENGTH (WT%)
i C4/OLEFIN RATIO AT MIXING POINT (VOL/VOL)
VOLUME % ISOBUTYLENE
IN OLEFINS

These charts are used by Kellogg to show correlation of rich mixture performance number (F-4 P.N.+4.6 CC Tel/Gal) of aviation alkylate with operating variables.

Kellogg Alkylation

-INVESTMENT PAYOUT IN ONE YEAR!

A quick way to higher octane ratings at lowest operating and investment costs is sulfuric acid alkylation—utilizing Kellogg's unique cascade reactor and auto-refrigeration system.

Providing exceptionally high yields of superior alkylate, this Kellogg process sharply reduces the cost of the isobutane recycling equipment; maintains acid consumption at the lowest possible level; assures efficient mixing in reaction sections at low horsepower.

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An example of what Kellogg alkylation can do in attaining premium results working with various blending components is provided by a recent study undertaken by Kellogg engineers of a proposed new 25,000 BPSD refinery on the Gulf Coast. Here, alkylation of total C_3 and C_4 olefins, assuming extraneous isobutane available at nominal price, results in the production of 15 volume percent on crude of high octane alkylate, with a payout on incremental investment over a base case of well under one year.

A comparable study of incremental alkylation not requiring extraneous isobutane, but compared with a base case incorporating non-selective catalytic polymerization, shows a payout of just over a year. Under these conditions alkylate production amounts to 6 volume percent on crude, and the combined alkylate plus catalytic polymer to slightly over 9 volume percent.

REFINERY PROCESS DIVISION, THE M. W. KELLOGG COMPANY, 225 BROADWAY, NEW YORK 7, N. Y.

In Canada: The Canadian Kellogg Company, Limited, Toronto. In Europe: Kellogg International Corporation, London

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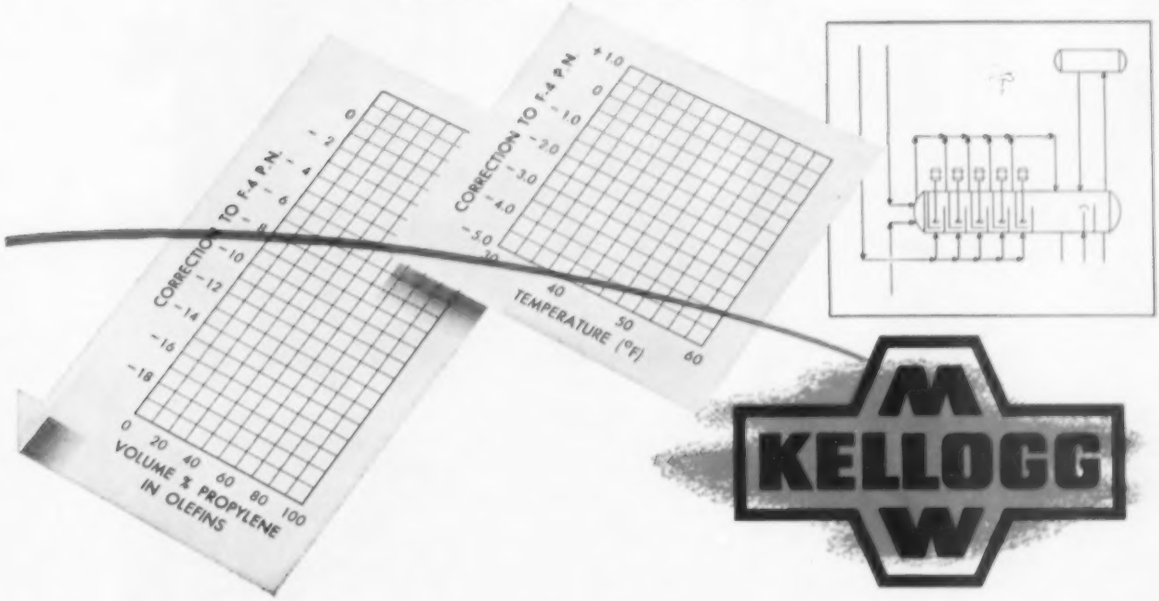
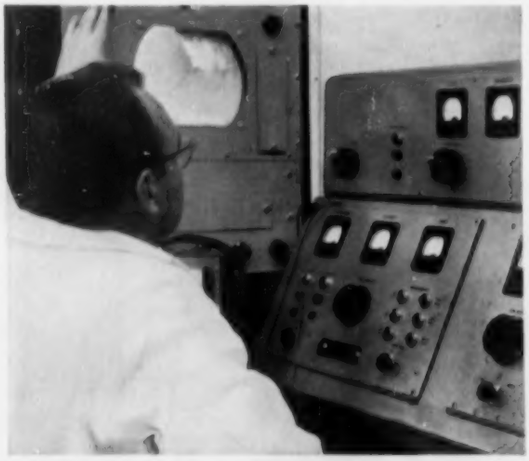


SHELL REPORTS

A PICTURE ROUNDUP OF SOME ACTIVITIES THAT MADE NEWS OUTSIDE THE PETROLEUM WORLD

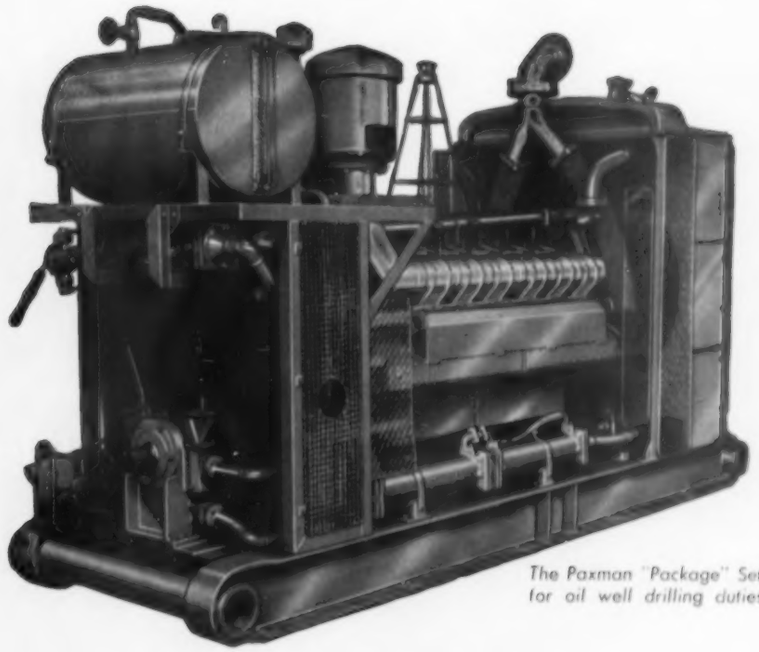
A CAPITAL CONTRACT. To power its new turbo-prop Viscounts, Capital Airlines has selected Shell Oil Company as its supplier of fuel. Throughout flight history, as aeronautical engineers have built new engines and new planes, Shell research has developed the fuels to fly them. Shell Oil Company, leading supplier of aviation fuels to the United States commercial airlines, is helping turbo-prop travel become available for everybody.



ROCK AGER. What Mother Nature takes 10 million years to accomplish, Shell's atom smasher completes in one week. Behind thick walls, particles of rock are bombarded with radiation and thus aged by the first 2-million-volt Van De Graff accelerator in the petroleum industry. In this way, members of Shell's Exploration and Production Research Division are learning more about the age of rock and the origin of oil. Shell's advanced techniques in oil research are a strong investment in today to provide for tomorrow.

HITTING THE ROAD. It's the new method developed by Shell to measure the load-carrying capacity of asphalt. Electronic impulses simulate the jarring effects of traffic, and record the effects of continuous vehicular movement. Without damaging the highways, engineers get a long-range picture of how much a road can take. Shell's research is a step towards a better understanding of road requirements — and to more efficient, longer-lasting highways in the future.

SHELL



The Paxman "Package" Set for oil well drilling duties

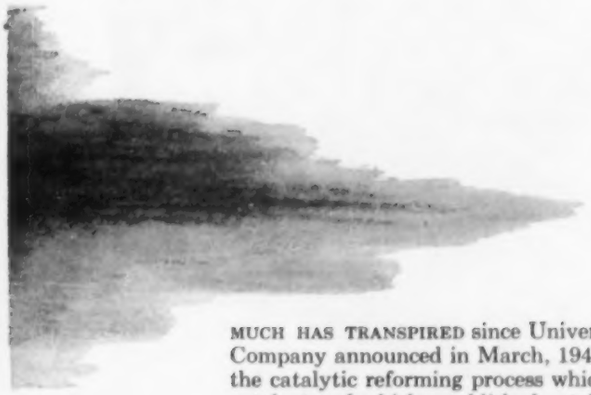
packed with power

Those engaged in the tough, arduous work of oil well drilling think highly of the Paxman "Package" Set. They like it for its sufferance of rough handling, its ability to keep going under any conditions and its adaptability for almost any type of drilling rig. Paxman Package Sets are available with a horsepower range of 130-665 s.h.p. at the output shaft.

PAXMAN *diesel engines for oil well drilling*

DAVEY, PAXMAN & COMPANY LIMITED COLCHESTER *(ASSOCIATED WITH RUSTON & HORNSBY LTD. LINCOLN)*

a report from
the leader in the field of
CATALYTIC REFORMING



MUCH HAS TRANSPIRED since Universal Oil Products Company announced in March, 1949, the availability of Platforming—the catalytic reforming process which pioneered the use of a platinum catalyst and which established catalytic reforming as one of the basic refining processes. Just seven months after this announcement, the first commercial unit was placed on stream. Since that time the process has received an unsurpassed acceptance throughout the world's petroleum refining industry.

The unprecendented recognition given to this catalytic reforming process is indicative of how well it has fulfilled the industry's need for an economical and efficient method to up-grade low-quality napthas. Platforming's adaptability is brought out in the sizes of the units which have been installed. With capacities ranging from 500 to 29,000 barrels, the UOP Platforming process has proved to be an answer to refiners' octane problems, no matter what the scope of their operations might be.

Recognizing that the ever-increasing demands for higher octanes would place additional burdens on the petroleum refining industry, Universal continued its studies in catalytic reforming. The results of this work were announced last March, with the introduction of Rexforming.

This newest catalytic reforming process will permit refiners to produce fuels of any useful octane rating, without limitations due to feed stocks. Laboratory and pilot plant tests have shown Rexforming to be capable of producing gasolines in excess of 100 clear octane.

Commercial acceptance of Rexforming has been immediate. Units are now being engineered and construction on these installations is scheduled to begin shortly.

The future for catalytic reforming is certainly one of continued growth and progress. It is a future in which Universal Oil Products Company will play a leading role.

UNIVERSAL OIL PRODUCTS COMPANY

UOP

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Universal Service Protects Your Investment

THE LAST WELD

350 miles in 5½ months!

19 days ahead of schedule in spite of 60 canal and river crossings, swamps, desert, hard rock, sand dunes, irrigated fields, crossing roads, railways and two barrages. This 16″ diameter pipeline carries natural gas from Sui to Karachi.

The new £10,000,000 project, a vital artery in the progress and development of South Pakistan, and the longest natural gas pipeline in the Eastern Hemisphere, was constructed by D. & C. and William Press in association with the Morrison-Knudsen Corporation.

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Stanvac seeks to do its part in developing the capacities of its employees so that they become better qualified to carry on the company's operations and to participate in supervisory and administrative functions.

Greater knowledge is truly a power for good.

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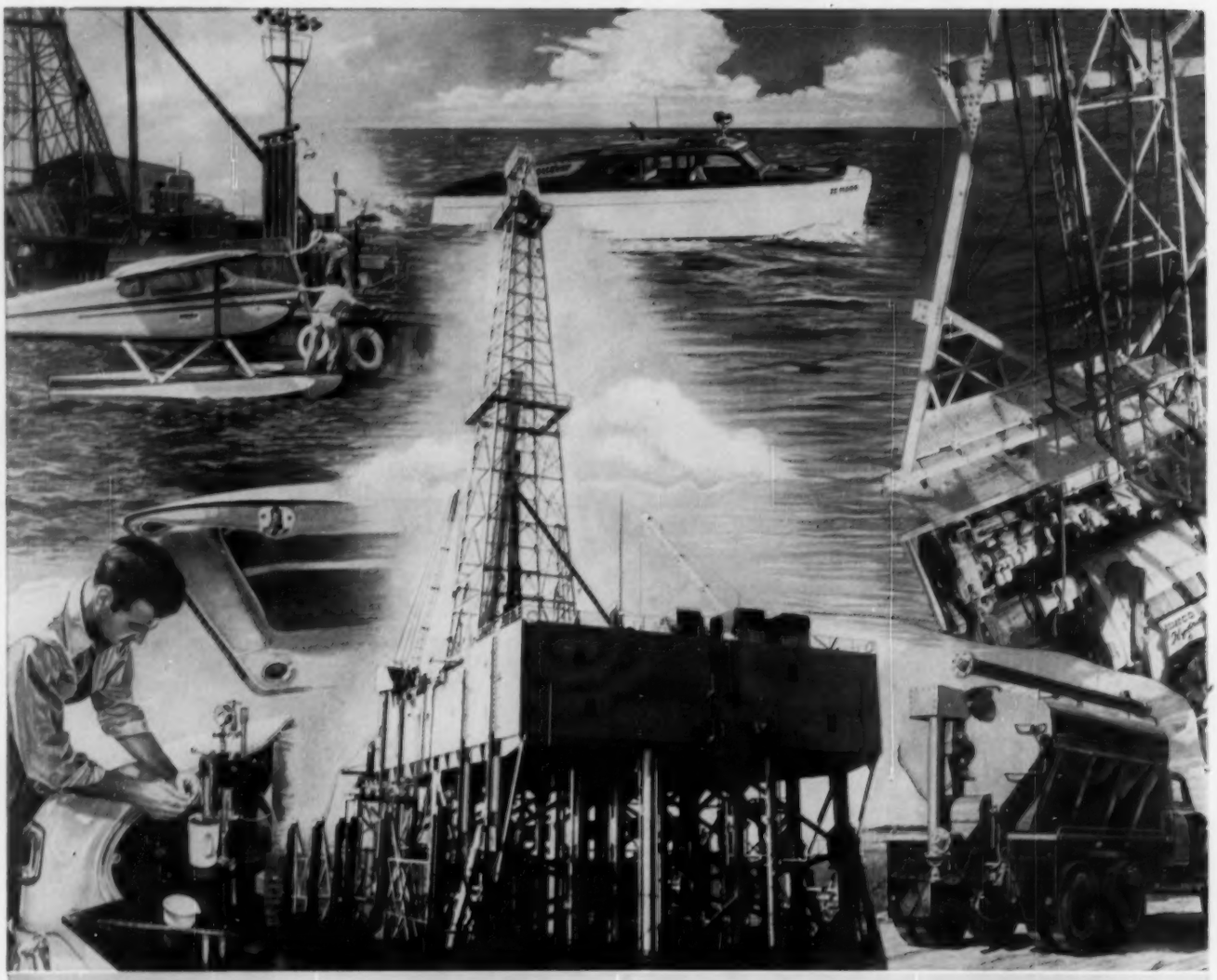

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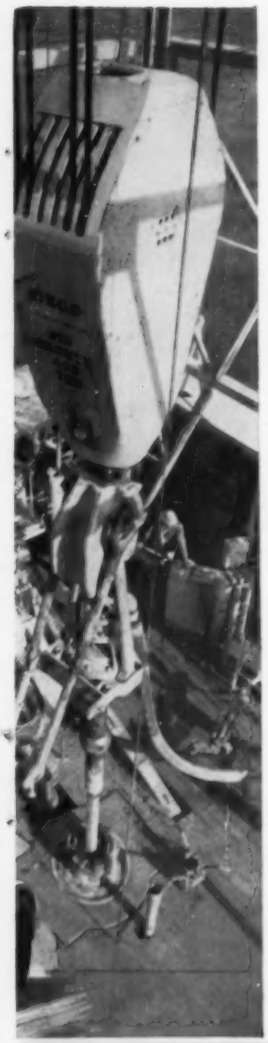

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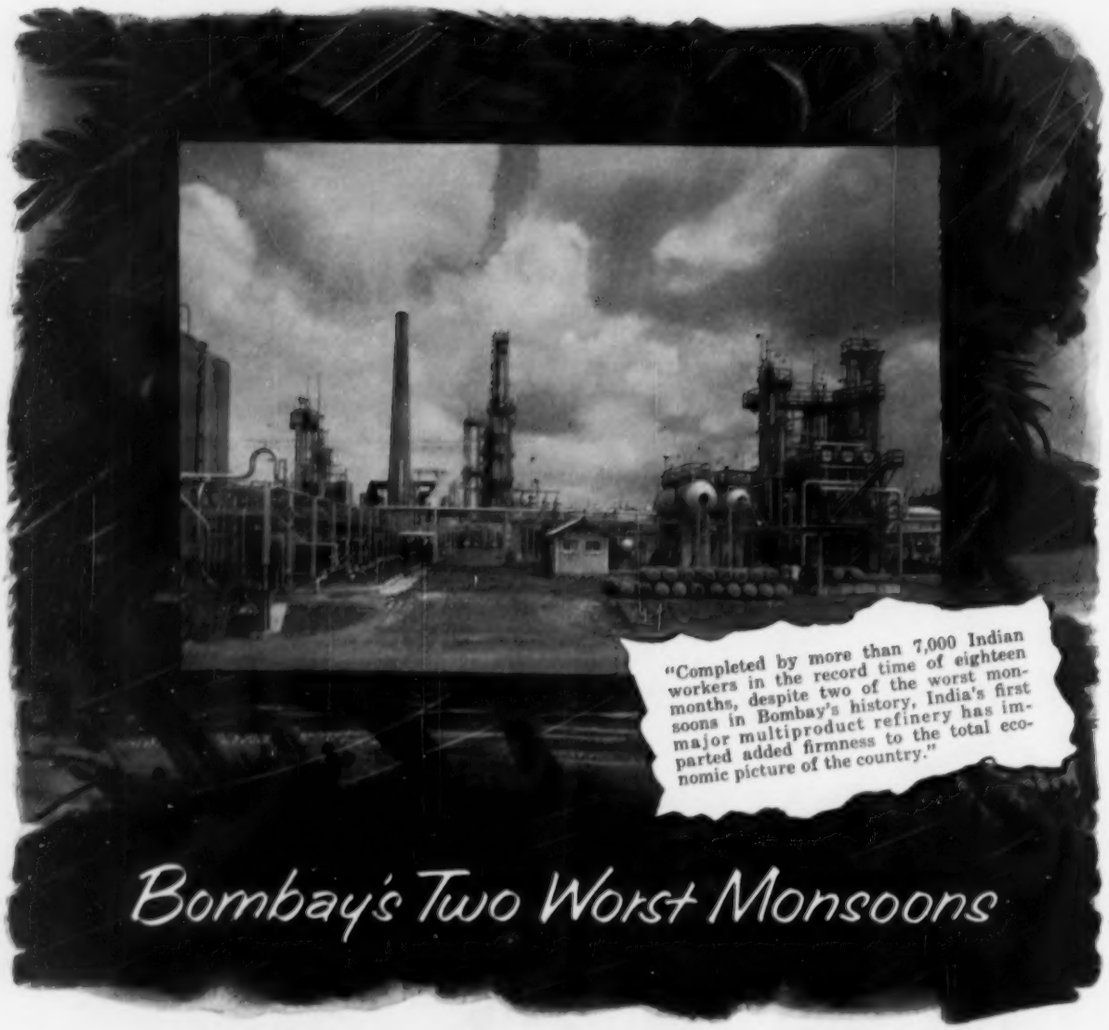
"Completed by more than 7,000 Indian workers in the record time of eighteen months, despite two of the worst monsoons in Bombay's history, India's first major multiproduct refinery has imparted added firmness to the total economic picture of the country."
Bombay's Two Worst Monsoons

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DESIGNING ENGINEERS AND CONSTRUCTORS FOR THE PETROLEUM AND CHEMICAL INDUSTRIES

VOL. 26, NO. 9, AUGUST, 1955

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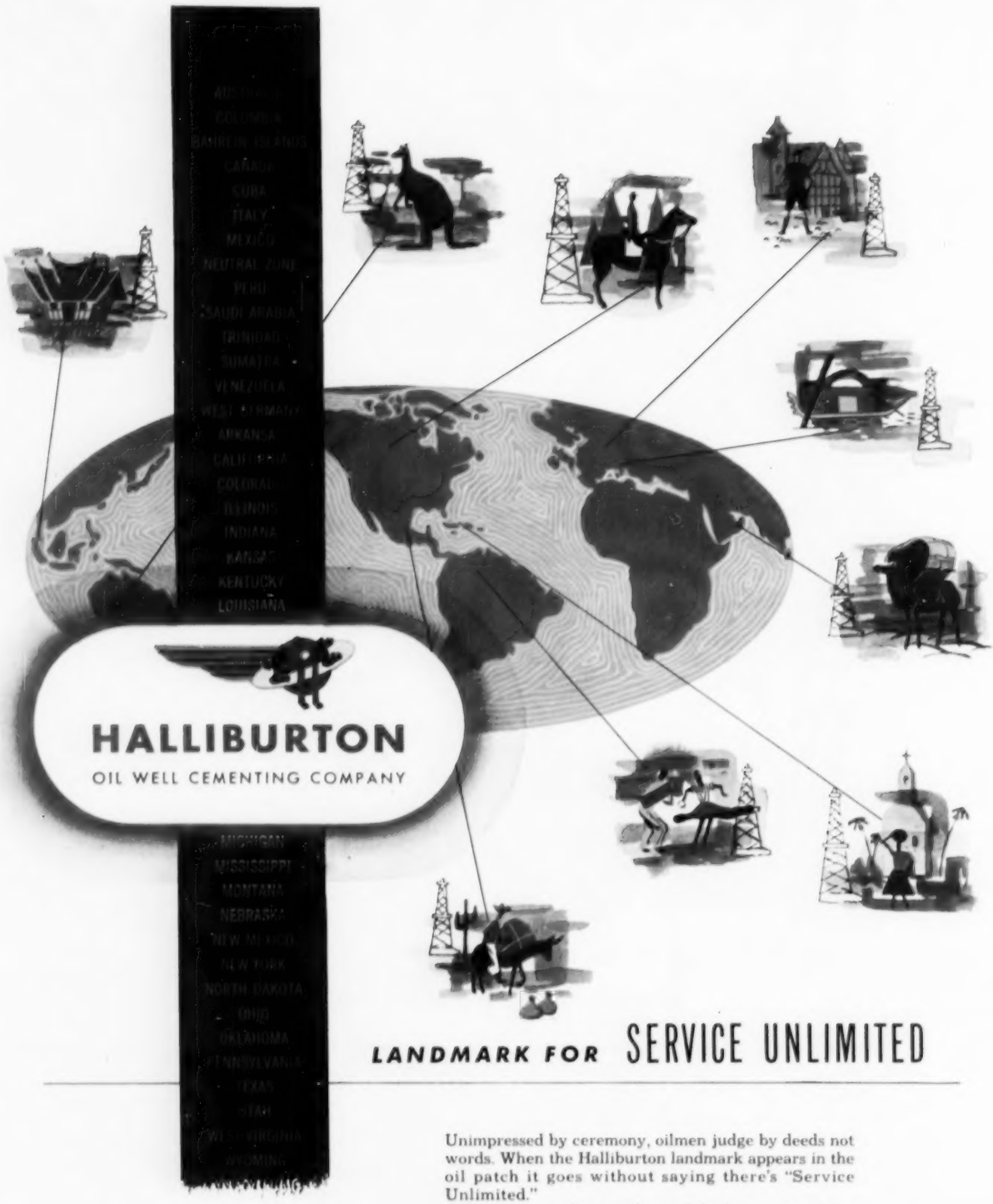
THIS MONTH'S COVER

A Shell Oil Company portable shot-hole drill operating in the Burnt Timber region about 40 miles northwest of Calgary, Alberta, Canada. The Canadian Rockies rise in the background. Shell holds several million acres under lease and reservation in western Canada. Color plates are reproduced through the courtesy of the Editors of *Shell News*.



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Unimpressed by ceremony, oilmen judge by deeds not words. When the Halliburton landmark appears in the oil patch it goes without saying there's "Service Unlimited."

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Spread thoroughly to every one of Halliburton's camps, this policy of "Service Unlimited" accounts for Worldwide leadership in its field. And research is our most important service.

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OIL WELL CEMENTING COMPANY
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"PROGRESS IN SERVICE THROUGH RESEARCH"

The Fourth World Petroleum Congress

NOW THAT THE Fourth World Petroleum Congress has become history and the activities that filled its daily sessions have merged into a definite pattern in the minds of its participants, it becomes possible to form some appraisal of its significance to the international petroleum industry and its effect upon the progress of good will and understanding among the members of the oil fraternity throughout the world.

First of all, mention must be made of the size of the gathering. With more than 4,600 recorded delegates and visitors of both sexes, the attendance far exceeded that of any previous Congress. The number of countries represented was greater, the scope of the topics discussed in the technical sessions was broader, and the exchange of information between men of like interest and activities from different countries was freer and more general than in earlier meetings, evidence that the principles on which the Congress was founded and the ideas which it seeks to promote are receiving increasingly wide acceptance. As Dr. Murphree, chairman of the Permanent Council, observed in his address at the opening session: "Trust and confidence in each other and among nations can only come from the people of the world meeting and knowing each other better." This, he explained, applies as truly to the industrial field as to the realms of politics and international relations, and therefore the World Petroleum Congress is a contributing factor along this line.

The widening recognition of the international importance of the Congress was indicated by the presence in Rome of participants from more than 40 countries coming from every quarter of the globe and by the fact that 34 separate countries had established national committees to participate in plans for this year's meeting. Greetings from many lands were received by officials of the Congress and a particularly pleasing impression was made upon the delegates by the message from President Eisenhower, attesting the deep interest of the United States in the aims and activities of the Congress, which was further emphasized by the country's distinguished delegation, led by Secretary of the Interior McKay.

An incident that attracted much interest and attention was the arrival of a sizable group of Russians. Although they did not take an active part in the technical sessions of the Congress, they brought along a mass of documents and reports relating to various phases of the Russian oil industry and gave out statements of the great expansion of production, particularly of the field which they denominated the "Second Baku." Reserves of this area were said to be far greater than those of the original Baku which for decades has been the chief source of the country's supply. There was the usual lack of specific detail as to production and other phases of operation which the industry has learned to expect in official statements regarding Russia's oil, but voluminous reports were supplied as to the efficiency of Russian drilling methods and general equipment. Apparently a primary purpose of the visit was to present the application of the Soviet Union for membership in the Congress in which several of the satellite nations already are represented.

Organization of the Fourth Congress was a model of efficiency. As soon as Italy's invitation was accepted, the oil companies of the country, backed by the state authorities, entered enthusiastically upon the work of preparation. An organizing committee with representatives of all the principal Italian oil companies and all associations concerned with petroleum was set up and subcommittees were appointed to deal with the various divisions of activity. For nearly two years the members of this organizing group, under the direction of Dr. Arturo A. Muston of Esso Standard Italiana and his staff, were busily engaged in planning and publicizing the many features projected for the Congress, corresponding with prospective delegates and visitors and in general making known to the world the opportunities and attractions

awaiting them in Rome. In this they had the counsel and assistance of the Permanent Council, whose members made numerous trips to Italy to advise on problems of location and arrangements based on their experience with earlier Congresses.

As the time of the meeting approached, the tempo of activity in the general headquarters steadily rose and reached its culmination as the sessions began. The original staff was then expanded by scores of secretaries, guides, interpreters, messengers and young women serving at the registration desks. All of these assistants were carefully trained in their respective duties and throughout the meeting they worked enthusiastically, regardless of hours, to meet incessant demands for aid, direction and information. To them, no less than to the directing officials, must go a substantial share of credit for the smooth working of the Congress in dealing with the great group of polyglot visitors attending the meeting.

Since the primary purpose of the World Congress is to assemble for each meeting a comprehensive program of technical papers covering all phases of petroleum operations and all branches of the industry's world-wide activities, the post of director of the technical division is one of vital importance to the success of each Congress. This all-important position was entrusted to Prof. Carlo Padovani, director of the Stazione Sperimentali Combustibili of Milan, a most fortunate choice, as events proved. In preparing the program for this main activity of the meeting, Prof. Padovani had the invaluable assistance of Dr. E. V. Murphree, chairman of the Permanent Council and his associates, and of the national committees established in various countries.

Through these organizations, working in close collaboration with Prof. Padovani, a well-balanced program was worked out for each of the nine sections of the technical division, but a prodigious amount of labor fell upon the shoulders of the Director and his associate, Dr. Alberto Girelli, in handling the 230 papers finally accepted for presentation, providing uniformity in the tables and drawings accompanying the papers, supervising their translation into the languages officially adopted by the Congress and directing their distribution in advance of the meeting.

While these preparations were under way, the Unione Petrolifera, the association of all petroleum companies operating in Italy, was busily engaged in preparing an elaborate program of entertainment for visitors to the Congress and their families, including receptions, concerts, two specially arranged performances of the opera "Traviata," a fashion show for the ladies and numerous other functions. These combined activities of the oil industry were supplemented by those of individual oil companies and organizations serving the industry, each of which provided diversions of its own in such array that the most energetic visitor was incapable of accepting more than a fraction of the invitations showered upon him. Of this side of the Congress it can only be said that the hospitality of Rome was overwhelming and that no visitor to the Fourth Congress can ever forget his delightful experiences nor the many attractions of the Eternal City.

Highlights of the meeting included the audience for visitors by the Pope, the reception by the Mayor of Rome and the final reception at the Terme Diocleziani.

As the head of all the varied activities of this memorable gathering, Prof. Marcello Boldrini, President of the Congress, met all the onerous duties of his position with a dignity and simplicity that won the hearts of the thousands of participants.

The Congress ended on a joyous note when it was announced that the next meeting would be held in the United States in 1959 and that Dr. Murphree, who had sought to resign his position as chairman of the Permanent Council, had been prevailed upon to accept reelection, a tribute to his great work in connection with the Fourth Congress.

PUERTO BERRIO — MEDELLIN

products pipe line laid across Andes

By Quinton Peters

SOUTH AMERICA'S newest oil products pipe line, a $5,000,000 line which snakes through the Colombia jungle, across treacherous rivers and over a range of Andes mountains, has now been completed and will soon open up a booming market.

The 6-inch line stretches 180 kilometers from Puerto Berrio on the Magdalena river to Medellin, Colombia's second largest city.

Williams Brothers, world-wide constructors of pipe lines, laid the line. The project was begun in March 1954.

Medellin, a bustling manufacturing hub with a population of 350,000, is centrally located between Bogota, roughly 150 air miles to the southeast, and the Panamanian border, about the same distance to the northwest.

Medellin is the most highly industrialized city in Colombia. Known to Colombians as "The City of Eternal Spring," Medellin nestles deep in the Rio Porce valley between mountain peaks that rise to 12,000 feet. Medellin also is the center of Colombia's thriving placer gold mining industry.

The long-awaited pipe line will now permit the Medellin area to receive oil products from the 30,000-barrel-a-day refinery at Barranca Bermeja, which is some 100 kilometers down the Magdalena river from Puerto Berrio. Before the new line was completed, oil products from the refinery were piped only as far as Cantimplora, just across the river from Puerto Berrio.

Welders and natives pay scant attention to the steep slope at their backs as they work on this newest of South America's products pipe lines. Starting in the jungle river bottom at Puerto Berrio, it rises sharply to an elevation of over a mile in the Cordillera Central range of the Andes mountains.

The pipe line follows a mountain railway for short distances where the terrain makes this necessary.

Turns in the pipe line are as necessary as the shade-providing umbrellas.

Landslides on the steep slopes of the Andes added perils to pipe line laying operations.

Pump station on the new products line.

Two pump stations were constructed by Williams Brothers along the Puerto Berrio-Medellin route—one at Caracoli, the other at Cisneros. An existing pump station at Cantimplora, which pumps products across the river, completes the power needs for the new pipe line.

The recent dedication ceremony for the new pipe line found Colombia's most distinguished personalities on hand. Headed by President Gustavo Rojas Pinilla, the group of dignitaries at the ceremony included Colombia's Minister of Mines and Petroleum, Minister of Public Works, Minister of Education, the Governor of the Department of Antioquia, the Mayor of Medellin, and representatives of companies involved in the pipe line project.

Williams Brothers, long accustomed to laying pipe lines in all parts of the world, encountered a variety of climatic and terrain conditions. The new line starts in the river bottom area of Puerto Berrio where jungle conditions prevail. The line then proceeds to cross major rivers and numerous streams. Rising sharply from the river, the pipe line plunges into the Cordillera Central range of the Andes mountains. From Puerto Berrio to the highest point on the mountain range, the difference in elevation is more than one mile.

Although the equator is only six degrees south, the mile-length elevations meant cold weather for pipe liners during much of the construction. In addition, the country's heavy rainy season virtually halted all operations for weeks.

Major significance of the pipe line is the opening up of Medellin and surrounding communities as an oil products market. Previously, this highly industrialized area had been harassed by the slow and costly transportation of oil products into the mountainous area. There is no highway between Puerto Berrio and Medellin. The only oil products reaching Medellin previously were transported on the Antioquia Railway.

The 180-kilometer line requires 22,500 barrels of product to fill and will be good for 8,300 barrels of gasoline a day. Current consumption for the Medellin market, however, is about 2,600 barrels a day. Indications are that at the present time the line will be used primarily to deliver gasoline. However, some diesel fuel, along with kerosine and aviation gasoline, will also be pumped.

The pipe line, which is formally known as the Oleoducto de Antioquia, carries with it some bonus benefits to the Medellin vicinity. For one thing, the Antioquia Railway will be relieved of 26 percent of its freight load and will now be able to devote this capacity to other consumer and capital goods.

While the opening up of the Medellin area as a greater consumer of oil products will increase Colombia's oil consumption, the country will continue to be an exporter of crude. Daily crude production is slightly over 100,000 barrels, well above consumption in a nation which is just now beginning to flex its industrial muscles.

While the simplest procedure would have been to route the line parallel to the existing railroad, Williams Brothers decided against this plan. The railways, observing the traditional railroad pattern of hugging the valleys and gorges, is especially vulnerable to landslides in the mountain areas. In an effort to free maintenance crews from this future problem, Williams Brothers chose where possible to route near, but not parallel to the railway. For only a comparatively few kilometers does the line trace the railway's path.

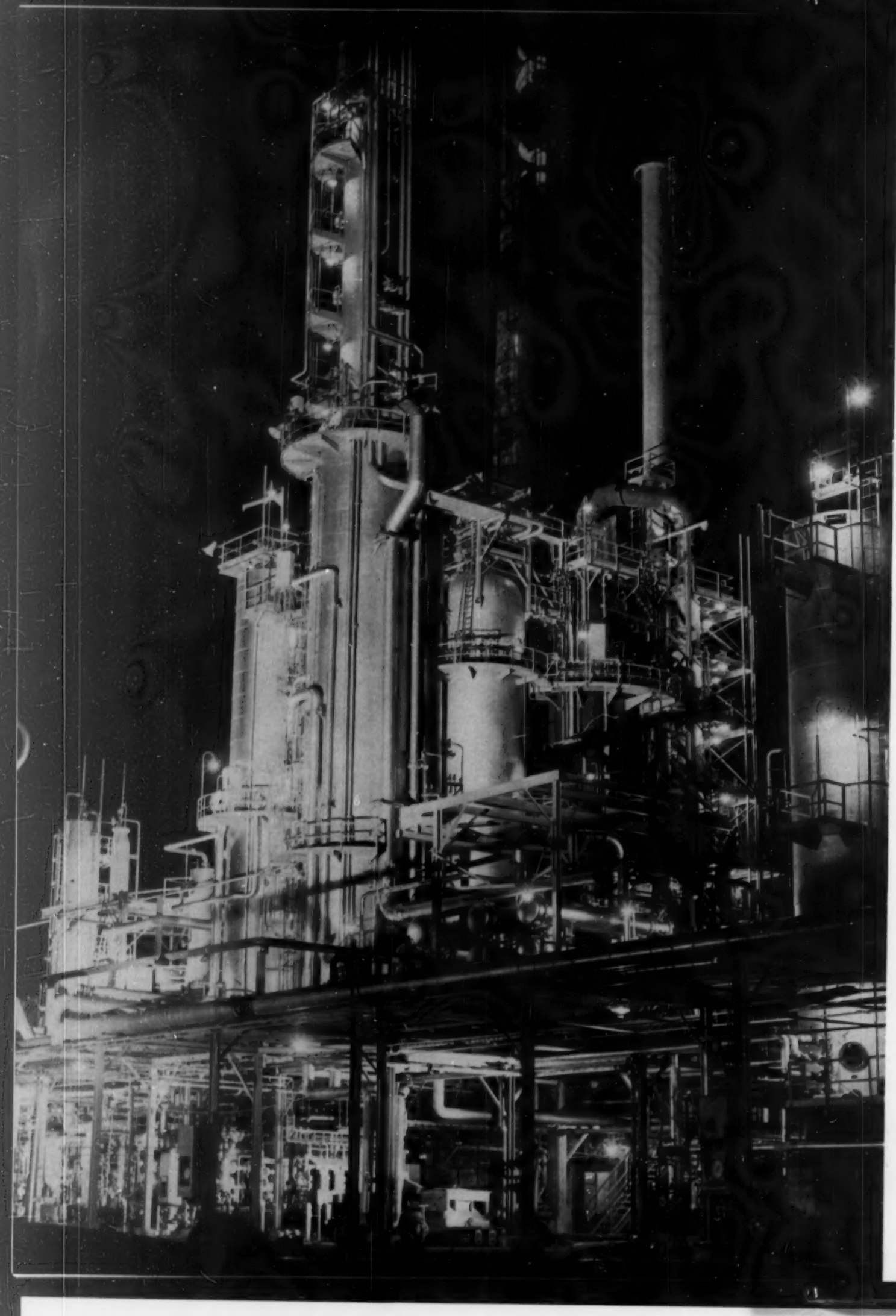
Despite the studied selection of the route, maintenance of the pipe line is still expected to be a continuous chore because of the frequent landslides. These landslides, which have plagued Colombia always, result from the loose composition of the earth, which is practically rock-free, and the excessively heavy rains.

For Williams Brothers, who have laid most of Colombia's network of oil products pipe lines, the Puerto Berrio-Medellin line was the third job completed in the country since 1952. Another line is under construction.

Williams Brothers' first line for Colombia was a 6-inch pipe line to the Department of Cundinamarca extending 147 kilometers from Puerto Salgar on the Magdalena river to Bogota, the capital of Colombia. This mountain-climbing line, completed in 1952, started at an elevation of 600 feet and rose sharply to Bogota's 8,600-foot elevation. The following year the company built an 8-inch line from Puerto Salgar down the river to Cantimplora, some 146.5 kilometers.

Under construction now is a 101-kilometer pipe line extending from Buenaventura on the Pacific coast to Yumbo, near Cali in western Colombia. This line is 6-inch and 8-inch.

Williams Brothers has been retained to train the Colombian crew to run the Cundinamaraca and Antioquia pipe line systems.



Night view of the cat cracker at the Hamburg-Harburg refinery of Esso.

Another view of the new catalytic cracking section at the Esso refinery in Hamburg-Harburg. In the foreground are Hortonsphere tanks for the storage of butane.

GERMAN refining capacity continues upward

By E. M. Stahmer

THE OIL REFINING capacity of West German refineries and hydrogenation works was further stepped up in 1954. For a while it seemed that the building of new plants under the OEEC program would be completed when an annual capacity of about 12 million tons had been reached. This opinion was also held in our report published last year.

Recently domestic oil demand has continued to grow at a rate which was not anticipated to be so high. This has been particularly true of the consumption of heavy and also light fuels, i.e. products which some years ago were unable to find a market in this classical coal country. Heavy oil demand increased from 800,000 tons in 1952 to 1.7 million tons in 1954 (including refinery consumption and bunker liftings to German flagged ships) and will apparently climb more and more in the future. Thus, the oil refining industry, which, according to the earlier consumption scheme, had concentrated all its efforts on producing mainly gasoline and diesel oil by means of erecting modern cracking, hydrogenation and reforming facilities, faces a new situation.

Table I is an analysis of consumption of the various oil products in the first quarter of each of the past three years.

Two factors induced the oil industry not to stop after having reached the originally planned goal, but to continue with the expansion of capacities: these were the high rate of the general consumption increase and the unforeseen sudden demand for fuel oils.

In our last year's report we described the completion of the newly built refinery of Gewerkschaft Erdoel-Raffinerie Emsland at Lingen-Holthausen and the facilities added to several existing refineries and hydrogenation works. These new units made the total crude intake capacity of the West German mineral oil refining industry rise from 9,780,000 tons at the end of 1953 to 12,643,000 tons at the end of 1954. To this increase BP Benzin- und Petroleum GmbH., Hamburg-Finkenwerder, contributed 660,000 tons, the hydrogenation works of Scholven-Chemie AG. at Gelsenkirchen-Buer 600,000 tons, the hydrogenation works of Gelsenberg Benzin AG. 500,000 tons, Esso AG., Hamburg-Harburg, 300,000 tons, and Deutsche Shell AG, Hamburg-Harburg, 200,000 tons.

Scholven-Chemie AG. in the meantime added a special heavy-gasoline dehydrogenation plant and a polymerization plant to its fluid catalytic cracker for improving the quality of the produced motor fuels. The processing method of the dehydrogenation plant can be compared with the catalytic reforming procedure developed in the United States.

Gewerkschaft Deurag at Hanover-Misburg is erecting a combined Unifining-Platforming unit under license from Universal Oil Products Co., which enables Deurag also to desulfurize thermally cracked gasolines and to improve the octane number.

The new plant, which is jointly built by Lummus Co., New York, and Lurgi, Frankfort, has a daily capacity of 2,500 barrels and is to treat about 50 percent of cracked and straight-run gasoline each.

The new refinery of Gewerkschaft Erdoel-Raffinerie Emsland at Lingen-Holthausen is adding a Houdry catalytic reformer to its facilities. This is being built by Lummus Co., and will be put into operation before the end of this year. The input capacity will be 3,000 barrels daily. By means of the Houdriformer Lingen hopes to produce motor gasoline with an octane number (research method) of 90 or more, unleaded. Chemische Werke Huels AG., Marl, will produce the catalyst for the Houdriformer.

The first European unit for production of butadiene from normal butane by the single-step Houdry dehydrogenation process will be installed by Chemische Werke Huels AG. at Marl, Kreis Recklinghausen. The unit will be operated by a newly-formed company of which Chemische Werke Huels will be half-owner. Houdry Process Corp. will provide designs.

The plant's annual production of 36,000 metric tons of butadiene will be used for the manufacture of synthetic rubber, and the project is regarded as the first step in development of a modern synthetic rubber industry in West Germany. Dr. Paul Bau-

TABLE I

WEST GERMAN CONSUMPTION PERCENTAGE OF VARIOUS OIL PRODUCTS

	1st Quarter 1953	1st Quarter 1954	1st Quarter 1955
Total quantity	1,418,000 tons	1,658,000 tons	2,254,000 tons
Gasoline	31 percent	30 percent	24 percent
Diesel and gas oil	31 "	29 "	30 "
Lubricants	6 "	5 "	5 "
Bitumen	6 "	5 "	4 "
Fuel oil*	20 "	22 "	27 "
Others	6 "	9 "	10 "
	100 percent	100 percent	100 percent

* Including refinery consumption and bunker liftings to German flagged ships.

TABLE II

ANNUAL CAPACITY OF WEST-GERMAN CRACKING AND REFORMING PLANTS

(December 31, 1954, in thousands of tons)

	Catalytic* Cracking	Thermal** Cracking	Catalytic Reforming	Thermal Reforming	Hydrogenation
BP	—	210	230	150	—
DEA	360	—	—	—	—
Deurag-Nerag	—	210	—	100	—
Esso	530	—	—	165	—
Gelsenberg	450	—	300	—	720
Lingen	660	—	—	—	—
Ruhrchmie	—	—	83	—	—
Ruhroel	—	—	—	36	—
Scholven	240	—	100	—	300
Vacuum	360	—	—	—	—
Wesseling	—	550	—	220	330
	2,600	970	713	671	1,350

* Including recycle.
** Without recycle.

The Platforming unit at the BP refinery, Hamburg-Finkenwerder.

mann was requested by the West German Ministry of Economics to study the possibilities of synthetic rubber production in cooperation with the German Rubber Industry Association. West Germany requires about 60,000 tons of synthetic rubber annually to meet requirements imposed by a foreseeable market for 150,000 tons of natural and synthetic rubber.

An outstanding expansion project has been undertaken by Deutsche Shell AG., German affiliate of the Royal Dutch/Shell group, in its refinery at Hamburg-Harburg. The output of this plant and of the other Shell refinery at Monheim (Rhine) falls far short of the requirements of the company's marketing division in Germany. Demand has been partly met by the hydrogenation works Wesseling, with which Shell has a long-term refining contract. Observing the general upward trend of oil consumption, Shell decided to enlarge its annual crude oil treating capacity at Harburg from 900,000 tons at present to 2.6 million tons. The Shell refinery was built on the southern bank of the Sueder-Elbe, an arm of the Elbe river. Some time ago the company obtained a site opposite its old one on the northern bank of the Sueder-Elbe. A tank farm on the new site was linked by underwater pipe lines with the older refinery and a central laboratory was erected here. According to the new plans, a UOP Platforming unit is being erected which will have a daily input capacity of 2,500 barrels of heavy gasoline. Procon, London, and Edeleanu, Frankfort, are contractors.

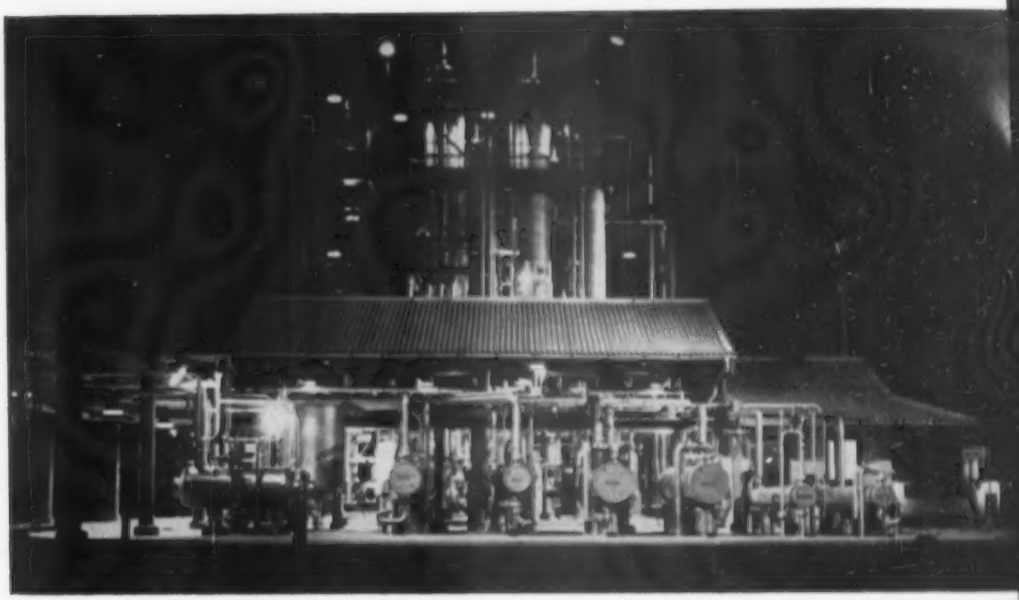
In the course of the next four years, Shell intends to build a catalytic cracker with commensurate distillation units here; furthermore, a hydro-desulfurizer for gas oils as well as a second Platformer. About $45 million is to be invested in these projects.

Ruhrchemie AG., Oberhausen-Holten, will contribute another addition to German capacity. In due course the new catalytic cracking plant (Socony-Vacuum type) at Oberhausen will be completed. Koch Engineering Co., Wichita, is building this cracker to which a Perco reforming plant licensed by Phillips Petroleum Co. is to be added.

While the mineral oil consumption in West Germany rose by 26.4 percent in 1954, the output of the refineries increased by 35 percent to 8,628,446 tons. German plants processed 6,002,516 tons of foreign crude (mainly Saudi-Arabia and Iraq) and 2,688,673 tons of German crude.

For 1955 the plan of AEV (Association of Refining Industry) anticipates an input of 6.89 million tons of foreign and 3.05 million tons of German crude. The production goal is 9,657,500 tons of finished products, including 3.05 million tons of gasoline, 2.61 million tons of gas oil and 1.6 million tons of fuel oil. There will be a surplus output of gasoline for which a market must be found while fuel oil (especially light grades), diesel oil, and minor quantities of special products will have to be imported.

QAIYARAH ASPHALT PLANT BEGINS OPERATION IN IRAQ



Night view of unit showing exchangers and pumphouse, with soda washery on left.

By E. Lawson Lomax

OPERATIONS of the Iraq Government asphalt plant at Qaiyarah have begun well in advance of the target date despite logistics difficulties caused by extensive floods. Erection of the 60,000 tons per year plant was begun in February 1954 and the scheduled completion date was August 28, 1955.

Actually the plant was ready for commission five months ahead of schedule on March 28 despite the Tigris floods at Baghdad and Basrah. In planning the building of the refinery, it was arranged that all material should be shipped to Basrah and then be transported by rail through Baghdad to the site. The flooding necessitated re-routing the shipments to Beirut and then transferring the material by rail northward and through Turkey to Qaiyarah. This re-routing entailed about 120 days lost time in 1954.

The project consists of facilities for the production of asphalt for road making and similar purposes from heavy Mosul oil. The plant is complete in respect to all auxiliary and ancillary equipment required for the production and dispatch of the finished products.

The Lummus Co. Ltd. was prime contractor to the Iraq Government, Ministry of Development and Development Board. Lummus undertook the design, engineering, and procurement of equipment and materials, and arranged for the field erection to be handled by D. & C. & William Press Ltd. Costain-John Brown Ltd. was employed by the Iraq Government to act as the engineering advisors on this project.

The distillation plant consists of an atmospheric tower, a vacuum tower and a splitter tower, with the necessary pumps, heat exchangers and their auxiliaries, and has been designed to be as simple as possible in operation in view of the personnel to be employed on it, but it has certain departures from conventional procedure necessitated by the nature of the feed stock which emits about 1.5 percent of H_2S by weight when heated to distillation temperatures. General characteristics of the crude are shown in an accompanying tabulation.

On entering the system, the crude oil passes through two heat exchangers, the first one being the light gas oil exchanger. This gas oil is drawn from the bottom of the splitter tower, and is cooled sufficiently to go to storage in this exchanger.

In the second heat exchanger the crude is further heated by finished asphalt drawn from the vacuum tower, which in its turn is cooled sufficiently to pass to storage. From the second heat exchanger it passes to about the middle trays of the atmospheric tower. The conventional method would be for it to pass from this exchanger via a pipe still to the atmospheric tower, but it was found that this crude, when heated above 400°F, emits a large quantity of H_2S, almost certainly due to the decomposition of sulfurous hydrocarbons.

This hydrogen sulfide would have a highly corrosive effect on mild steel pipe still tubes, with metal temperatures of about 750°F, and would either mean the provision of high alloy tubes or frequent replacement of M.S. tubes, increasing maintenance

View from tank roof. Generator building at left, boiler house in center, distillation unit at right.

costs and also reducing operating efficiency.

Thus the major portion of this hydrogen sulfide is driven off in the atmospheric tower, and the de-gassed crude, along with heavy distillates, passes to the re-boiler of the splitter tower, supplying heat to this unit, in which the top side stream of the atmospheric unit is split up into light gas oil and gasoline.

From this re-boiler, the crude then passes through the pipe still where it is heated to 670°F (355°C). The heated crude from the pipe still is discharged to the lower trays of the atmospheric tower and at approximately the same level, but on the other side of the tower, a small quantity of caustic soda is introduced to further reduce the possibility of corrosion.

Caustic soda, handled in the form of a 10 percent solution, is added to the heater charge by withdrawing a small amount of the heater charge, mixing it with caustic soda solution and returning it to the residence section. Water is flashed off as steam, the concentrated dispersion of soda in oil mixing with the rest of the oil in this section.

Another advantage of this arrangement is the dilution of the crude in the atmospheric tower by distillates, which reduces its asphalt content when passing through the pipe still, and greatly lessens the tendency toward coke formation in the tubes.

Part of the top side stream from the atmospheric tower is used as reflux, the net make passing on to the stripper tower. The uncondensible gases from the top of the tower go to the flare.

In the stripper tower the light products from the atmospheric tower are separated into uncondensible gas, gasoline and light gas oil.

The overheads pass to a contact condenser, in which the gasoline is condensed and the uncondensible gases pass to the flare.

Part of the condensate is used as a reflux in the tower, the net make being gasoline, which is given a soda wash.

The reduced crude from the atmospheric tower passes without further heating to the vacuum tower, the vacuum in which is generated by a steam injector which is fitted with a barometric leg and steam separator.

Heavy gas oil is taken off as a side stream, part of it being used for reflux and the net make going to storage. Residue from the tower is asphalt to grade which is cooled before going to storage by passing through the crude oil heat exchanger.

The immediate operating program calls for the production of straight asphalt and cut-back, a portion of which will be delivered in drums and the remainder by rail and road tankers.

A complete drum making plant has been installed which is capable of manufacturing 500 drums per day for solid products and 100 drums per day for cut-back. The drum loading rack is capable of handling 1,000 drums per day, and loading racks have been built for the filling of road and rail wagons.

The plant is completely self-contained as to the supply of utilities. Steam is generated in three horizontal "Economic" dry back boilers, each with a capacity of 10,000

TABLE I

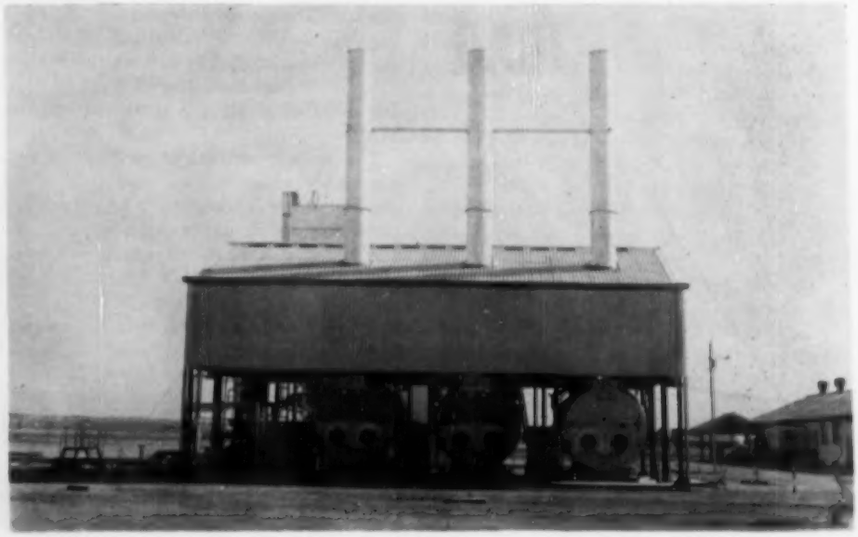
GENERAL CHARACTERISTICS OF MOSUL CRUDE

Specific Gravity @ 60°F	0.9554
Water content (Weight)	0.06%
Sulfur " "	7.63%
Pour Point	—15°F
Viscosity SSU @ 70°F	3337 Secs
" " " 100°F	1180 Secs
Flash point COC	85°F
Fire point COC	130°F
Carbon Residue, Ramsbottom	13.9%
" " Conradson	13.6%

ASTM Distillation

I.B.P.	110°F	43°C
5% off	195°F	90.5°C
10% "	325°F	162.5°C
15% "	400°F	204°C
20% "	455°F	235°C
25% "	520°F	271°C
30% "	595°F	313°C
35% "	665°F	352°C
40% "	740°F	393°C
45% "	810°F	432°C
50% "	885°F	474°C
55% "	940°F	504.5°C
60% "	985°F	529.5°C

Boiler plant.



lbs./hr. of steam at a working pressure of 250 psig supplied by John Thompson, Wolverhampton.

An interesting point in the running of these boilers is that they are fired with gasoline produced during the crude distillation. This gasoline is of low quality, from a motor standpoint, and has a high sulfur content which can be reduced, before being used as fuel, by a soda wash. All easily recovered condensate is collected and returned to the boiler feed system.

The electricity generating plant consists of three 250 kw steam turbine driven generators, made by Brown Boveri, at Baden, Switzerland. It has a capacity which is adequate for all needs of the refinery, including drum making plant, works lighting, etc., plus 250 kw for external domestic load for a nearby housing estate. The plant is completely self-contained, with all the necessary control gear for the prime movers and switch gear and control heat for the generators.

Water supplies are drawn from the River Tigris, and this presents peculiar difficulties. At certain periods of the year the silt content of the water from this river rises as high as 20,000 parts per million, and this must be considerably reduced before the water is suitable for cooling purposes. The water therefore is pumped from the river to a Dorr Oliver Clariflocculator, in which it is purified to an acceptable standard. This plant has a capacity of 70,000 imperial gallons of water per hour.

Part of this clarified water goes to the water treating system and the rest to the refinery cooling water system.

The water treating system has a capacity of 50,000 gallons per day, producing all potable water requirements and boiler feed make-up. It consists of:

a) A proportional dosing gear for the injection of aluminum sulfate for water coagulation.

b) A sand filter.

c) Soda dosing equipment for correcting pH value.

d) Sterilizing equipment for potable water supply only.

e) Hydrogen ion starvation unit for the conversion of bicarbonates in the water to free carbon dioxide gas.

f) Sodium base water softener.

g) Deaerator equipment for the removal of oxygen and carbon dioxide.

h) Sodium sulfite and caustic soda dosing equipment to maintain the desired sulfite residual and alkalinity in the boilers.

i) Phosphate dosing gear to prevent formation of hard scale in the boilers.

Engineers' houses at Qaiyarah bitumen refinery.

An adequate fire-protection system is installed, consisting of a permanent foam system for storage tanks, high pressure water main with hydrants and its own high pressure pumps, and a mobile fire-fighting unit.

The workshop includes a garage and a machine shop with a full tool equipment.

The office for the permanent supervisory staff and the laboratory are both fully air-conditioned, the latter being equipped with all the instruments and apparatus necessary for control of the quality and specifications of the refinery products.

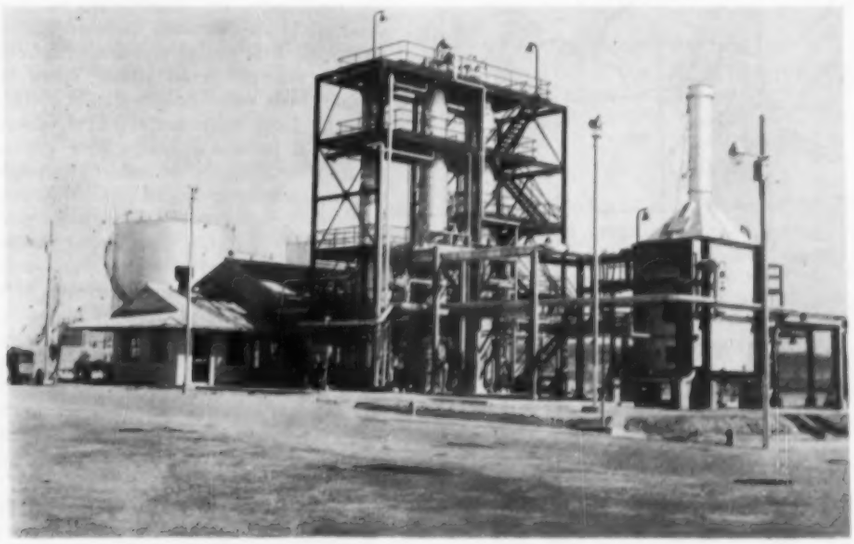
A sewage installation covers the offices and refinery lavatories, the sewage effluent being discharged to the river via a septic tank.

Crude for the Qaiyarah plant is stored in sealed tanks with gas lines leading to the flare where it is burned. This is necessary since the crude emits H_2S at ambient temperatures. Special gauging arrangements are used so that the tanks do not need to be opened for this operation.

The distillation plant is designed to produce 36,000 tons per year of 60-80 penetration straight run asphalt, 90,000 tons per year of 180-200 penetration straight run asphalt, and 15,000 tons per year of general purpose cut-back asphalt. In addition the plant will produce proportionate quantities of straight run gasoline, light atmospheric gas oil and heavy vacuum distillate fuel.

The contract called for the posts of refinery manager, chief process superintendent, chief chemist, refinery engineer and maintenance foreman to be filled in the beginning by foreign personnel to be recruited by the Lummus Co. The Lummus Co. is to give 12 months of advisory service after the plant goes on stream.

Distillation unit. Heater at right, tankage and pumphouse at left.



Further oil potentialities of SOUTHWEST IRAN

By Theodore Wild*

THE FOLLOWING brief discussion is intended to induce further interest in ascertaining the oil potentialities of southwest Iran. The writer believes that the discoveries to date have been made in more accessible reservoirs, but that deeper drilling will reveal accumulations which will probably surpass the productivity of fields already discovered.

*Petroleum Geologist and Natural Gas Engineer, Federal Power Commission.

Lower Miocene-Upper Oligocene Reservoirs: Ever since the first discovery of oil in southwest Iran by W. K. D'Arcy Exploration Co. in 1901, search for oil in that part of the world has followed a general trend, namely the locating of the Asmari limestone reservoirs. This L. Miocene-U. Oligocene zone has been so consistent in its prolific deliverability ever since its discovery that it has not been deemed urgent to attempt seriously the discovery and the development of other productive zones.

The commendable performance of the Iranian oil fields and the total absence, to date, of any artificial lift has been primarily due to the fact that only one interest, rather than several competitive interests, controlled and commanded the performances of those fields. One should make haste to assert that the technical ability of the Anglo-Iranian Oil Co. personnel played a prominent role in manipulating and in directing the performances of these fields.

The search for the Asmari limestone reservoirs has not been exhaustive enough to discontinue further attempts, notwithstanding half a century of exploration. For example, the Ahwaz area and its extension northwest to Susa and beyond it to Ain Serai has considerable possibilities. In addition to the Ahwaz structure there is at least one more structure in the Ain Serai-Susa area. In these two structures the Asmari limestone will be reached at a much greater depth. Geological work of the writer and his associates in 1935 confirmed the above views. Seismic work later supported the geological conclusions.

The great depth of 17,000 to 18,000 feet discouraged any drilling in the late thirties. World War II and the recently settled dispute with Dr. Mossadegh have been other factors in the delay in testing these two structures. Now that most of the above factors no longer exist, it is hoped that these two structures will be tested and it is certain that with today's improved technique and facilities such depths can be reached without much misgiving.

An inland region where the Asmari has favorable possibilities is south of Teheran. The Qum salt plug, which is located between the capital city of Teheran and the town of Qum, is an extrusion through Tertiary sediments. The rim of that salt plug could have productive potentialities. There has already been some shallow drilling in that area by local interests. However, deeper drilling at various distances from the rim of the plug is highly desirable. The reason why this northerly inland region has been particularly mentioned now in these notes is that any possible commercial discovery there will have a double value: on the one hand it will offset the expensive, presently contemplated, program of piping and of pumping fuel oil over several hundred miles of mountainous difficult terrain from the old fields of southwest Iran to Teheran; on the other hand it will greatly help the modernization of the capital city of Teheran which is one of the cherished dreams of the young monarch.

Cretaceous Reservoirs: In view of the ever-increasing demands for petroleum and

its products the world over, it is not untimely to direct attention to other possibly productive zones in the oil fields of southwest Iran. Surface and subsurface investigations have generally proven that Eocene sediments in southwest Iran are void of commercial oil reserves. On the other hand, similar investigations in the Cretaceous sediments have proven the presence of highly favorable conditions for the presence of commercial oil reserves.

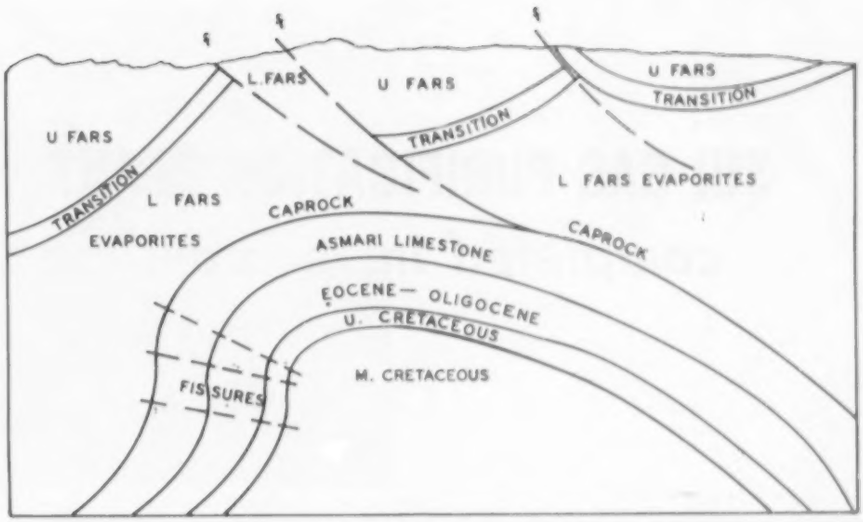
Deeper drilling in the Lali oil field has proven the presence of a considerable column of oil in the Cretaceous sediments. The extensive surface geological investigations by the writer and his associates in the years 1933 to 1938 showed more than one productive possibility in the Cretaceous sequence. In several localities near the towns of Shiraz and Fasa in southwest Iran limestones of Turonian age contained pockets of bitumen. Huge ruddits, the size of an average watermelon, which are typical Turonian fossils in that area, were oozing with bitumen. Also in various localities in the vicinity of the salt lake of Niriz, massive black-grey limestones of Cenomanian age crop out. These limestones, with their typical Ammonite fossils of Acanthoceras, have a bituminous odor when freshly chipped.

Such surface and subsurface evidences in Iran, supported by factual production from the oil fields of southern Iraq and of Kuwait, point out the excellent possibilities of the Cretaceous sequence in Iran. The Zubair and Rumaila oil fields of southern Iraq have been producing from a Lower Cretaceous zone. The prolific oil fields of Kuwait and of Kuwait-Saudi Arabia Neutral Zone have been producing from the Cenomanian sequence. These evidences alone lead one to conclude that the potentialities of the Cretaceous sediments in southwest Iran, particularly across the northern limit of the Persian Gulf from the fields mentioned above, must be very great.

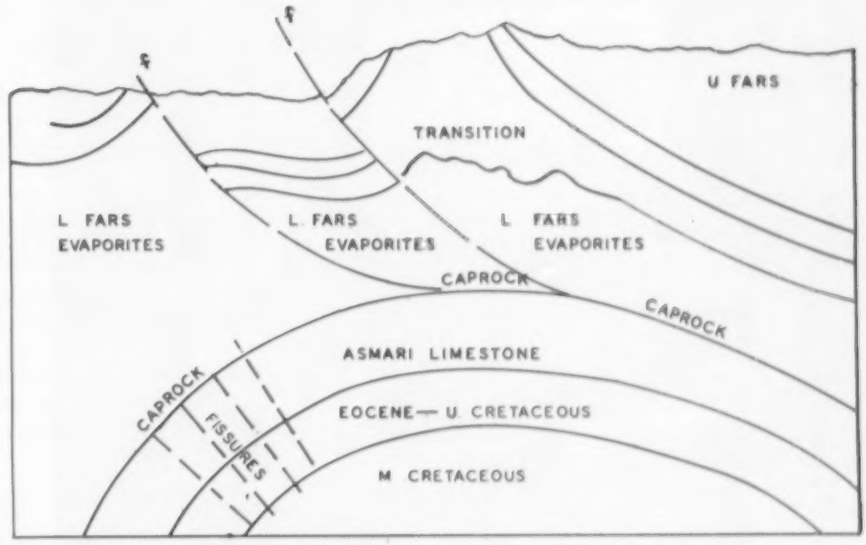
Other localities which are highly favorable for further investigations are the entire Persian Gulf coastal regions of Iran. The writer examined part of Kirman-Baluchistan area in 1943. The geology of the interior of that area, which belongs to the Nappe Zone, is highly disturbed. However, the coastal plain to a considerable depth inland, perhaps to the outcrops along the western edge of the Jeeroft plain, has impressive possibilities. Across the Persian Gulf, in the Qatar Peninsula, oil has been discovered in Jurassic sediments. On the Island of Bahrain as well as in Saudi Arabia, along the western coast of the Gulf, Cretaceous and Jurassic sediments have proven to be prolific. With favorable structural conditions, it is not unreasonable to expect similar possibilities on the Iranian side of the Gulf. Such earlier drillings as those in Dalaki and in the foothills of the district of Dashti along the Khormooj township were too shallow and rather too cursory to be taken as the final word in the exploration of that entire coastal region. Furthermore, our increased experience in the oil fields of the Persian Gulf area as well as our considerably augmented technical ability in deep drilling have opened up new avenues hidden from earlier explorers.

With the development of the technique of exploring, drilling and developing submerged structures, the entire offshore areas on both sides of the Persian Gulf have considerable possibilities. For example, such offshore islands as Kharak, near Bushire, and the continental shelf between it and the mainland is worth close examination and possibly testing, particularly since a few miles inland in Dalaki there are seepages and bituminous extrusions.

In conclusion it is hoped that this brief discussion will prove helpful in guiding and in furthering the efforts of other investigators. These notes were written with the particular intention of creating and of inducing an attitude of reappraisal primarily based on our more complete knowledge of the geological conditions of the area as well as on our better know-how in drilling and in exploration techniques.



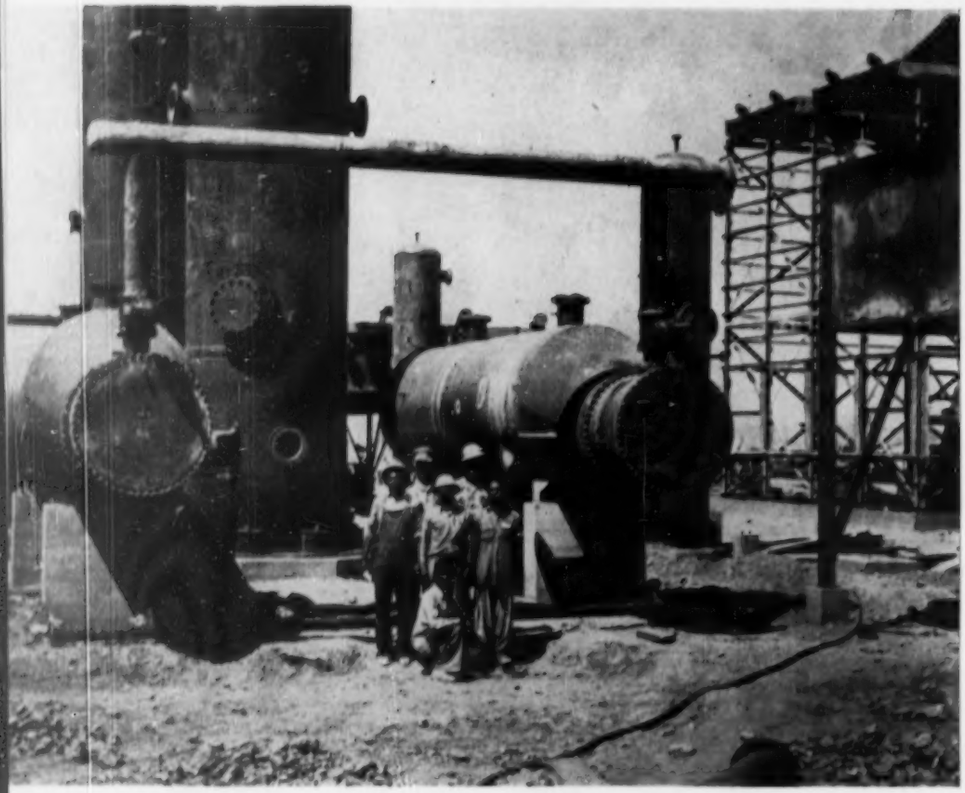
LALI OIL FIELD STRUCTURE



GACH SARAN OIL FIELD STRUCTURE

SUI GAS PURIFICATION PLANT
completed in record time

By E. Lawson Lomax



Lower part of the M. E. A. reactivator at the Sui, West Pakistan, gas purification plant of Sui Gas Transmission Co. Ltd.

FOLLOWING the discovery by Pakistan Petroleum Ltd. of the natural gas field at Sui, Baluchistan, West Pakistan, and the subsequent decision of the Pakistan Industrial Development Corp. to pipe the gas a distance of 350 miles to Karachi for industrial and domestic usage, it was in June 1954 decided to install a gas purification plant at Sui to remove the acid and moisture contents of the gas before transferring it to the pipe line.

A typical analysis of the sour gas is given in Table I together with the analysis calculated free of acid gases. (See page 48).

Analysis of the gases taken from the five other wells in the field showed that the hydrogen sulfide and mercaptan contents were fairly constant over the whole field, but the CO_2 contents varied from 4 percent to 8 percent.

The mercaptan content of the gas was considered to be acceptable for industrial and domestic purposes and a plant for the removal of hydrogen sulfide, carbon dioxide and moisture only was proposed. Other considerations in the development and design of the plant were the probability of subsequent expansion and the necessity for providing standby capacity due to the corrosive nature of certain aspects of the purification process, and the remoteness of Sui from sources of supplies of engineering equipment and materials. Furthermore, limitations were imposed on the maximum size and weight of individual plant units by the difficult transport lift between Karachi and Sui, which involved a rail journey of some 300 miles followed by a 50-mile road haul over rough desert country.

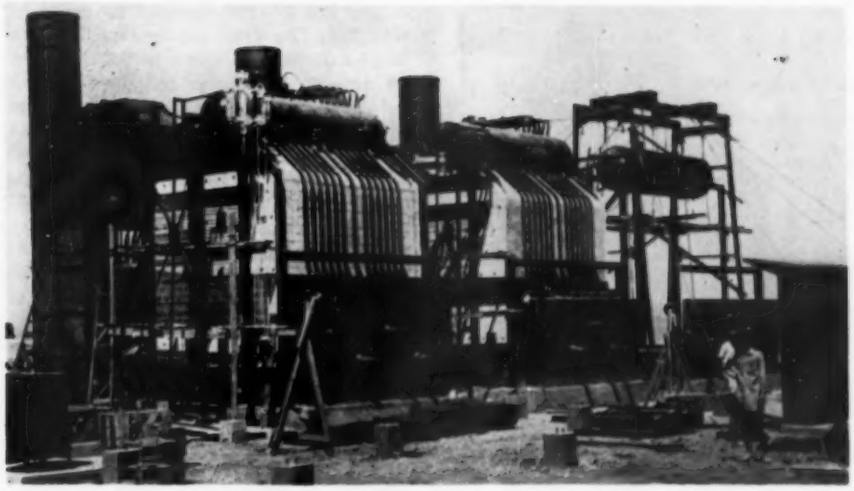
The process considerations and the plant capacity having been finalized, the contract was placed on the basis of great urgency as the plant had to be completed in 12 months to conform with the pipe line construction program.

A contract was duly placed by Pakistan Petroleum Ltd. with the Hudson Engineering Corp. of Houston for a purification plant capable of handling 74 million cubic feet of gas per day. The plant was to consist of two 37 million cubic feet per day sections, one of which will be kept as standby. As the sale of gas increases, further units will be added to satisfy demands and to ensure standby capacity at all times. At present it is anticipated that the demand will grow eventually to 120 million cubic feet per day.

The Hudson Engineering Corp. was virtually given a turnkey contract for the project, the only deviation from this being assistance rendered by Pakistan Petroleum Ltd. in transporting the plant units from Karachi to Sui and in various other ways.

Although the plant is being installed by Pakistan Petroleum, it will be operated by the Sui Gas Transmission Co. Ltd., a company formed to construct and operate the pipe line and gas distribution systems.

The plant is located on a barren rocky plain at the foot of the Bugti Hills, 350 miles northeast of Karachi. The nearest point on



Boilers #1, 2 and 3 under construction.

the broad gauge railway is some 50 miles to the west at Temple Dera, while Kashmor, 40 miles to the southeast of Sui, is served by a narrow gauge railway branch line from Jacobabad. Roads have been constructed from Temple Dera and Kashmor to Sui and these provide the only access to the site.

Climatic conditions at Sui are rather severe as will be seen from the following particulars which indicate the worst conditions:

Shade Temperature ..	120°F. max.
Shade Temperature ..	30°F. min.
Humidity @ 70° F.	100%
Humidity @ 95°F.	70%
Humidity @ 105°F.	50%
Humidity @ 130°F.	5%
Altitude above sea level ..	25 feet

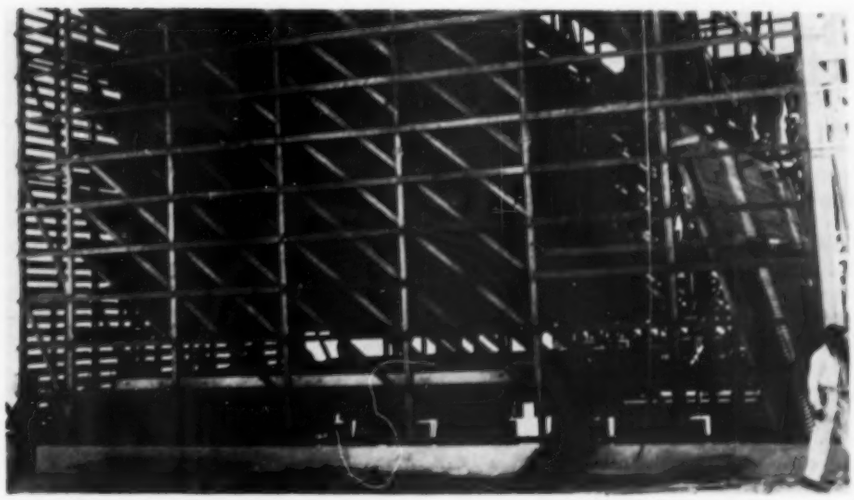
The atmosphere is saliniferous, corrosive and dusty.

Plant Operating Conditions: The well head gas pressure is of the order of 1,800 psi and the gas is delivered to the purification plant by a field collection system. The purified gas has to be delivered to the pipe line at a pressure of 1,070 psi, the gas pressure within the plant being governed by a controller on the inlet side, set to give the required pressure at the main pipe line. The plant, therefore, operates on a gas pressure of approximately 1,100 psi.

The process used for removal of the acid constituents is the well known Monoethanolamine (M.E.A.) process incorporating continuous reactivation of the M.E.A. solution, followed by dehydration.

The gas is transferred from the collection system header to the plant by a 12-inch main, in which the main pressure controller is located. This inlet main is then split to feed the two 37 million cubic feet sections, the flow through each section being as follows: the gas is passed through an inlet gas cooler to an inlet scrubber which removes the hydrocarbon condensate. From the inlet scrubber the gas passes to the M.E.A. contactor tower where the acid gases are absorbed by the solution. The gas passes on to a further scrubber for removing M.E.A. mist and then to the dehydration plant which consists of two units each capable of taking 74 million cubic feet per day. One dehydrator is on-stream while the other is being re-generated. The purified gas is then passed into the main pipe line.

The rich M.E.A. solution passes from the base of the M.E.A. contactor tower at reduced pressure to a flash tank and from there via heat exchangers to the top of the M.E.A. reactivator tower where the



Hudson Combinaire water cooling tower near completion.

TABLE I

Analysis of Separator Gas from Sui Well No. 1.

	Analysis of Gas as taken from Separator		Analysis Calculated Free of Acid gases.	
	Mol %	GPM @ 760mm Hg. Absolute @ 60°F.	Mol %	GPM @ 760mm Hg. Absolute @ 60°F.
Hydrogen Sulfide & Mercaptan Sulfur	0.15			
Carbon Dioxide	7.35			
Nitrogen	2.46		2.66	
Methane	88.52		95.70	
Ethane	0.89		0.96	
Propane	0.26	0.071	0.28	0.077
Iso-Butane	0.09	0.029	0.10	0.033
N-Butane	0.05	0.016	0.05	0.016
Iso-Pentane	0.04	0.015	0.04	0.015
N-Pentane	0.03	0.011	0.03	0.011
Hexanes	0.07	0.029	0.08	0.033
Heptanes Plus	0.09	0.041	0.10	0.046
	100.00	0.212	100.00	0.231

Hydrogen sulfide determined in field ..... 92.20 Grains/100 cu.ft.
Mercaptan sulfur determined in field ..... 3.80 Grains/100 cu.ft.
Other sulfur compound determined in laboratory ..... 0.32 Grains/100 cu.ft.

Total sulfur .....96.32 Grains/100 cu.ft.

Values calculated from above analysis:

Specific Gravity @ 60°F. (Air = 1)	0.653	0.583
Btu/cu.ft. @ 760 mm Hg. Absolute @ 60°F.		
Dry Basis	935	1009
Wet Basis	919	991

acid gases previously absorbed are stripped from the solution. After passing through a reflux condenser and accumulator to remove the steam carry-over, the acid gases are passed to a stack for dispersal in the atmosphere. The lean M.E.A. solution from the base of the reactivator is passed via the M.E.A. exchangers to M.E.A. coolers and from there to the M.E.A. surge tank. The lean M.E.A. solution is then pumped from the surge tank to the top of the M.E.A. contactor tower by means of steam turbine driven centrifugal pumps.

The two distinct plant sections are so designed and interconnected that there is complete interchangeability of units, pumps, etc. as between one section and the other. The plant sections are arranged on either side of a central overhead pipe rack which continues to the boiler plant area located 300 feet from the process area.

The very large pressure drop required in the gas fuel supply for the boilers is utilized for driving a two stage recompressor for recompressing low pressure hydrocarbon vapors which are flashed off in various units. The recompressed vapors are then re-admitted to the inlet gas stream.

The relief valves on all gas-containing units are connected to a hydrocarbon flare system. In addition a manually operated connection to flare is provided on the downstream side of the main pressure controller. The plant is protected from excessive well-head pressures by a relief valve connected to flare, on the collection system header.

A sour gas by-pass is provided around the plant for commissioning the boilers and for boosting the pressure in the main pipe line for testing purposes.

A high pressure shut-down is incorporated with the main pressure controller on the inlet side of the plant to shut off the gas supply automatically should a blow-out occur in the plant. A check valve is also provided immediately downstream of the dehydration units to prevent a reversal of gas flow from the pipe line.

Spare branches with blanked off valves are installed on the collection system header and another header similarly equipped is installed on the downstream side of the plant, so that future extensions can be connected in without having to shut down the plant. The main pipe line is connected to this latter header.

Utilities on this project were given careful consideration for various reasons. Water is pumped a distance of 38 miles to Sui from the Indus River and the need for water conservation is very great. The difficult up-country transport lift and the short time permitted for erection limited the choice of boiler plant, and the remoteness of Sui from large electricity undertakings necessitated the plant's being self-supporting as far as power supplies are concerned, and in addition the power requirements of the residential area, administrative offices, area workshops, etc. had to be provided.

The raw water is allowed to settle in tanks near the Indus River and is stored in two 10,000-barrel tanks at the purification plant. The water required for the plant and for domestic purposes in Sui is filtered in pressure sand filters and the plant requirements are softened by means of base exchange softeners. The present boiler plant consists of three 45,000 lb/hr Babcock & Wilcox Type FF15 No. 36 integral furnace boilers with a working pressure of 400 psi and steam temperature of 508° F. A deaerator heater is provided, together with feed water storage, chemical dosing pumps, etc. It is proposed to return approximately 95 percent of the condensate and the actual softened water make-up will therefore be small.

Two 200 kw back pressure Westinghouse turbo alternator sets are provided: one working, the other standby. These are intended mainly for supplying the electricity demands of the Sui area. Both the boiler and generating plants are arranged with a view to further extension, and in the event of the purification plant's being out of commission they can operate separately as a generating station.

The plant cooling arrangements have been designed with particular regard for the conservation of water and to this end air blast coolers are used in certain parts of the plant. The cooling towers are the Hudson induced draft type, the air coolers are the Solo-aire type and the water cooling towers are the Combin-aire type.

Most of the prime movers in the plant are back pressure turbines which exhaust at 50 psi into the process steam mains. A Solo-aire cooler is provided for condensing steam surplus to actual plant requirements.

The electrical power requirements about the plant are confined to a few small motors for pumps and compressors and the electrical installation is therefore comparatively simple, catering principally for lighting requirements.

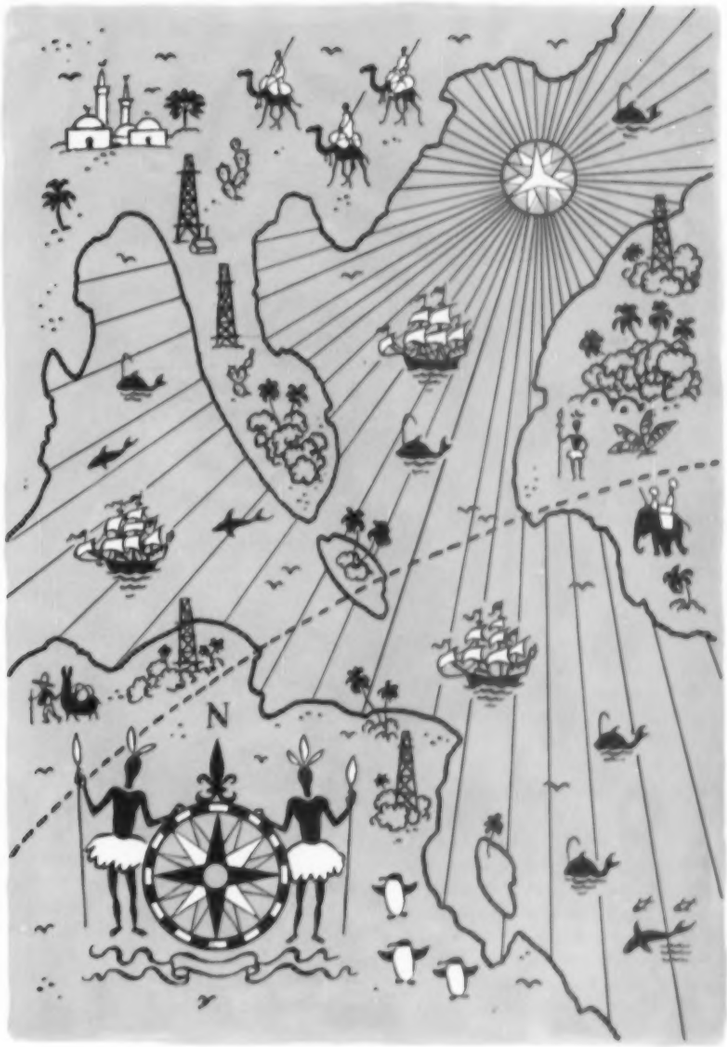
A telephone system is provided in the plant with extensions at the senior operators' bungalows.

The plant is fully controlled and instrumented and a control room is provided at a central location within the plant area. Instrument air is provided by an electrically driven air compressor, the compressed air being dehydrated before being passed to service.

A separate fire system is incorporated which is charged by two 250 gpm diesel driven pumps connected to the water storage tanks.

The plant is being erected by Hudson using American supervisory staff and American, British and Pakistani skilled personnel. A great amount of preparatory work had to be carried out before erection commenced, by way of organizing labor, accommodation, supplies of building materials, etc. and in particular the transport lift from Karachi.

Completion of the plant in 12 months from the time instructions were given to proceed with the project represents a remarkable achievement on the part of Hudson and of Pakistan Petroleum.



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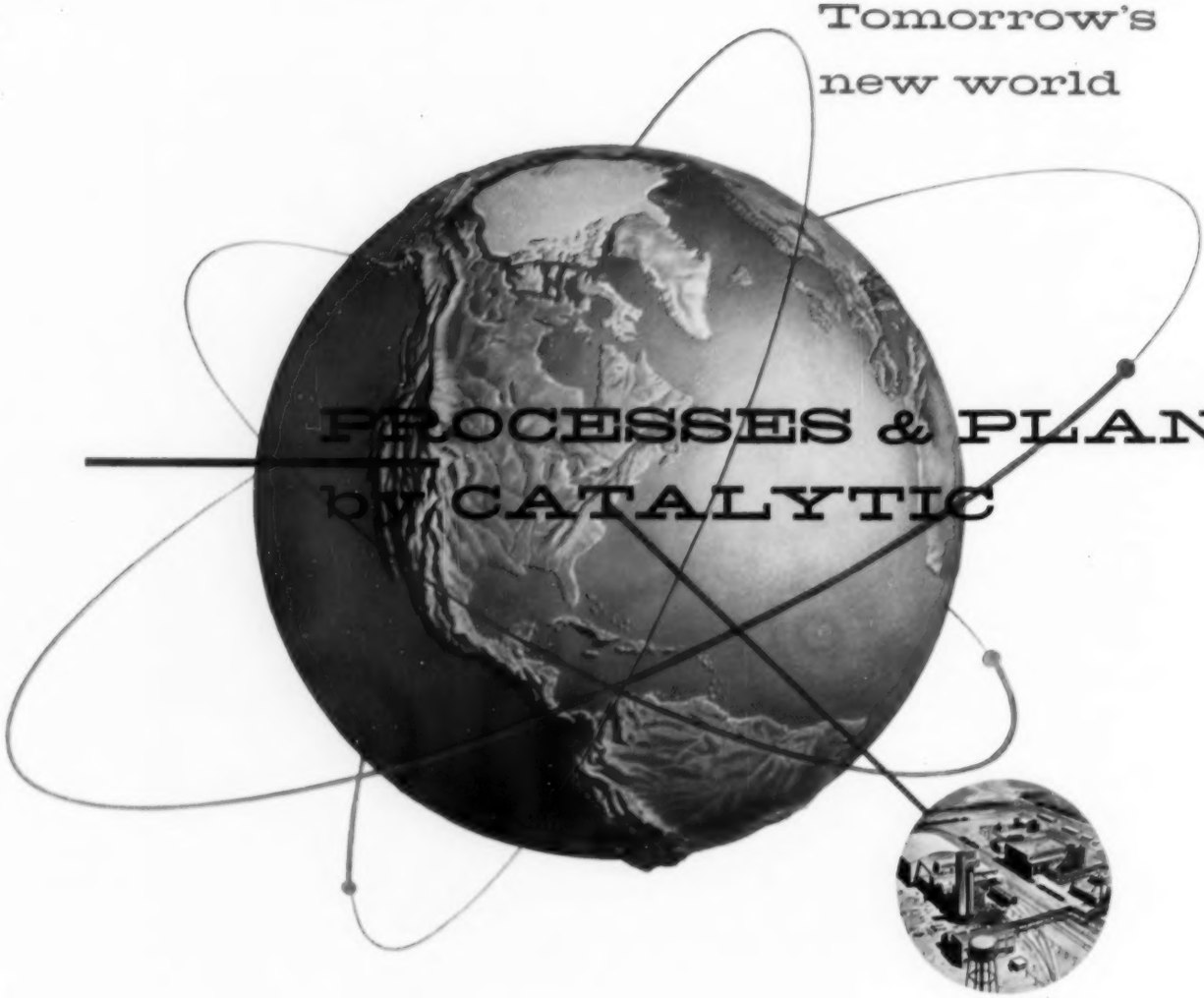

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SUI GAS FIELD

THE SUI NATURAL GAS pipe line in Pakistan, the largest venture of its kind in Asia, which is now in operation, may be but the start of natural gas pipe line construction in this Asian country.

The Sui line runs from the Sui gas fields in central Pakistan some 350 miles south to the capital of Karachi on the Arabian Sea. At the time the line was contemplated, some two years ago, the estimate of gas reserves on hand was on the order of two billion cubic feet. Now, the estimates of proven reserves in the Sui gas fields is in the neighborhood of four billion cubic feet.

As a result, the government has employed C. Stribling Snodgrass of Washington, D. C., to make a full study of the economic feasibility of laying another pipe line northward up to Lahore near the Indian border. A total of 400 miles up to Lahore, with branch lines to nearby communities and plants, is contemplated.

The Snodgrass report, which is now being circulated among officials in Pakistan and in Washington, is enthusiastic about the construction of the new line. All in all, this would make a 750-mile natural gas pipe line system, of 16-inch diameter, able to supply more than 200 million cubic feet daily of gas to Pakistan communities.

The new, northward stretch of the line would bring gas to Lahore, with an urban population of more than one million, to Lyallpur with 300,000, and to Multan with 350,000, which, together, will require 36,500,000 cubic feet daily by 1958, the Snodgrass report anticipates. The line also would reach Kot Adu, near the Taunsa Barrage, the site of a prospective thermal power plant and of a prospective iron and steel works which the government has approved for construction. These industries will need an additional 27,000,000 cubic feet daily by 1958, an assumed date for completion of the line.

This totals 63 million cubic feet daily and the demand is estimated to rise 15 percent a year to about 115 million by 1963.

"The capital requirement for the Sui-Punjab pipe line is estimated," says the report, "at £12,500,000 equivalent, which would be divided approximately 35 percent in rupees, 50 percent in sterling and 15 percent in dollars.

"This estimate includes a 16-inch main pipe line from Sui to Lahore, a 10-inch branch line from Multan to Kot Adu, distribution lines to primary industrial consumers, and additional purification plant capacity of 92,500,000 cubic feet daily installed as an integrated part of the purification plant which is now under construction to serve the Sui-Karachi pipe line. This purification plant capacity will be required to provide the necessary standby."

At the start, the line would be self-propelling throughout its entire length, but with the hookup to the Kot Adu power plant about 1963, one compressor station would be needed near Multan to boost the pressure there from about 500 pounds per square inch to 750 pounds per square inch.

"Transmission costs," the report stated, "have been estimated on the basis of the estimated capital cost of £12,500,000 and assuming (a) 7 percent overall return on capital divided 60 percent loan and 40 percent equity, (b) amortization of loan over 20 years, (c) depreciation at three percent and (d) operating costs comparable to those currently estimated for the Sui-Karachi line.

"These estimates indicate an initial delivered cost per 1,000 cubic feet of Rs. 1-3-4 decreasing to Rs. 0.15-3 after six years of load build up at the assumed rate. This is on the order of 30 to 40 cents American money.

"From this, it can readily be seen that the pipe line through Multan and Lyallpur to Lahore is economically justified, and that the price advantage of Sui gas increases substantially with increased throughput." The use of gas would displace certain quantities of coal, coke and oil for savings in foreign exchange of 600,000 pounds in the first year and up to 6,500,000 pounds in 1963.

Mr. Snodgrass made the initial survey and report on the basis of which the Sui gas line to the south was built, and served as technical advisor to the principals. This first line was financed up to its capital cost of £9,000,000 by money from Pakistan, British interests and the International Bank for Reconstruction and Redevelopment. The bank loaned 55 percent of the cost.

Mr. Snodgrass wound up his report by saying that the line to the south was completed in April of this year, ahead of schedule.

"A prompt decision on the Sui-Lahore line," he said, "should enable advantage to be taken of the equipment and facilities recently used in the construction of the Sui-Karachi line."

The last point in the Sui-Karachi gas pipe line was welded on April 18 at the Karachi end of the pipe line. Government officials attended completion ceremonies.

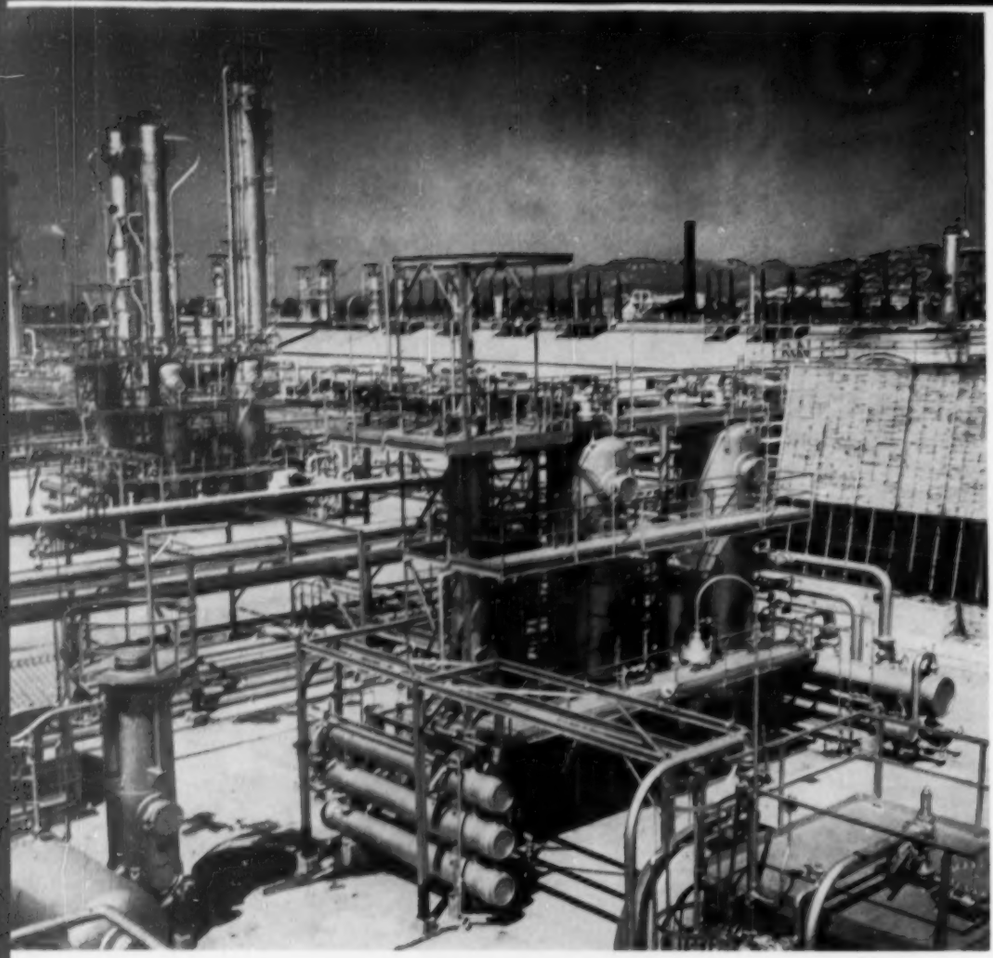
It will be recalled that following the discovery by Pakistan Petroleum Ltd. of a large natural gas field in the Bugti Hills of southern Baluchistan at Sui, some 350 miles from Karachi, the Pakistan Industrial Development Corp. and the Burmah Oil Co. (Pakistan Trading) Ltd. promoted the Sui Gas Transmission Co. Ltd. which was incorporated on Feb. 13, 1954.

Contract to lay the main pipe line was given to Pakistan Constructors, a partnership representing 75 percent Morrison Knudsen of the United States and 25 percent William Press, United Kingdom.

The first shipment of 16-inch pipe from Stewarts & Lloyds of London arrived in Karachi August 5, 1954. Laying of the pipe commenced on November 2 and within a period of just 168 days the pipe reached Karachi, thus maintaining an average laying of a little over two miles of pipe per day under most difficult climatic conditions and in the face of, at times, severe dust storms, torrential rains and heavy floods. On occasion, as many as 5,000 workers were employed to expedite the work and 1,600 were continuously employed. The pipe line crosses five rivers and more than a dozen major canals.

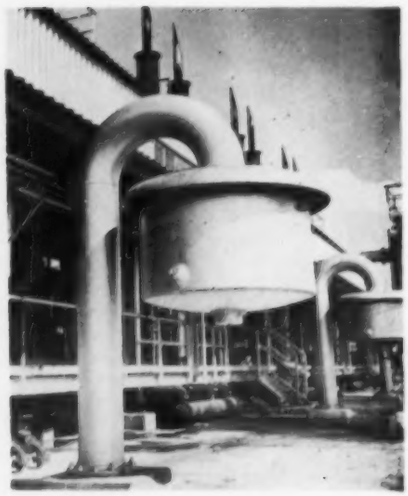
The Sui-Karachi gas pipe line is unique in the fact that it traverses practically every type of terrain including swamps, deserts, rock and green fields. A world record was also established during the construction when 401 welds were completed in a single day on this pipe line.

When industries switch over to gas this month and gas becomes available for fueling such plants as the Rohri Cement Works, the Hyderabad Cement Factory and power station, the Karachi Electric Supply and Cement Works, to name but a few, during the first stage of the gas development program, a saving of Rs. 24,430,000 in foreign exchange will be possible each year. At the estimated average first stage consumption of 45 million cubic feet/day, this saving in foreign exchange will increase to nearly Rs. 30,000,000, which is equivalent to £3,240,000 per year.

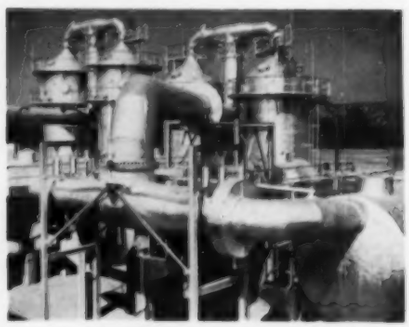


Left, general view of Mexico's Poza Rica refinery. Photos by Mary St. Albans.

Outside view of the compressor house at Poza Rica.



View of the Poza Rica sulfur plant.



MEXICO now fifth largest consumer of petroleum

By Antonio J. Bermudez

Director General, Petroleos Mexicanos. This article is taken from Mr. Bermudez' annual report and from an address at the Poza Rica plant inauguration.

SEVENTEEN YEARS after nationalization, our survey reveals that the Mexican oil industry is in a highly satisfactory phase of its development and is one of the factors contributing most to Mexico's rapid progress. Its expansion is responding adequately to present and future needs of the national economy, in which its growth is founded and its support assured. The record shows that no other industry or productive activity of the nation has achieved the progress realized by Petroleos Mexicanos.

Considering capacity for consumption as an indicator of wealth, this is the moment to note that Mexico now occupies fifth place among consumer nations of the world in petroleum derivatives. This is fundamentally due to a new orientation in the industry; what before was a source of raw

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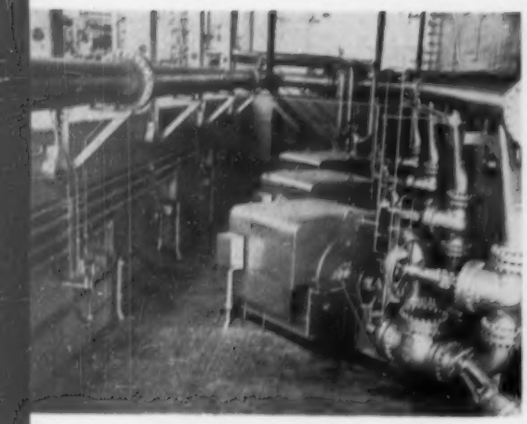
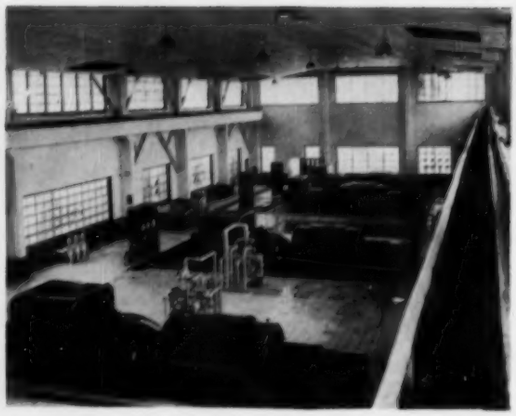


Pump motors for water re-pressuring operations at Poza Rica.



Elliott turbine-generators at Poza Rica.

material for export only now has been converted into a channel of energy for increased internal consumption. Mexico's oil today is serving the production of goods, not merely the purchase of goods.

Proof that the industry has reached maturity is based on success of exploratory projects as much as on extraction records. Organization and initiative of 45 exploratory crews, working in ten states, produced data leading to drilling of 121 test wells during the past year. As a result, ten new fields were discovered in that period, and four additional ones have been opened this year.

Notable for their importance among the 14 new fields are those in the Tecolutla-Gutierrez-Zamora region of Veracruz state, that of Acuatempan in the municipality of Tihuatlan in that state, and "La Venta," near the mouth of the Tonale River in Tabasco.

Analyses of exploratory data, plus that obtained from producing areas, led to drilling a total of 293 wells during fiscal 1955, with a combined depth of 1,591,440 feet. Fifteen additional units of modern drilling equipment were purchased and put in use.

Reserves of oil and gas today total 2,609 million barrels. Including 85 million barrels produced in 1954, these reserves increased by 396 million barrels over figures of one year ago, the highest yet achieved in the industry.

Average daily production during 1954 was 233,000 barrels, representing a 15.2 increase over the previous year, also a production record. Average daily figure for the current year is estimated at 287,000 barrels, and it appears certain that the daily rate will exceed 315,000 barrels by the end of the year.

In the interest of achieving efficient transportation of both crude oil and its derivatives, new pipe lines for oil, gas and refined products are being installed throughout the country, replacing old railway and trucking systems.

During 1954, important lines were laid between the "Nueva Faja de Oro" (New Gold Belt) field and the port of Tuxpan and work progresses on two new pipe lines, one 18-inch for crude and a four-inch for liquid propane, between the Poza Rica field and Mexico City. Construction of a 20-inch line between the Angostura field and the port of Veracruz is under way, also the Tampico-Monterrey product line. All these projects will be completed this year.

The goal of Pemex today is total refining of all crude that Mexican fields produce, carrying the refining processes to maximum utilization.

This year, the Salamanca plant was put in operation for production of all lubricants consumed in the country. This operation alone will stop the flight of $15 million annually spent for import of these products.

In July, enlargement of the Atzcapotzalco refinery was completed, increasing its capacity from 50,000 to 90,000 barrels. In Minatitlan, Veracruz, work goes forward rapidly on construction of a new and modern refinery, with catalytic cracking, and a daily capacity of 40,000 barrels. It will replace the old and antiquated refinery which is being dismantled.

The new and vital Poza Rica plants, inaugurated April 12, were installed for the double purpose of prolonging the productive life of fields in that area and achieving maximum utilization of oil, gas and sulfur impurities through more intensive refining processes. Hitherto, hardly 50 percent of the oil in these wells could be extracted because of continually reduced pressures as more crude was produced. One of the functions of these installations is to maintain pressures through injection of gas and water. Compression and absorption plants were installed to conserve gas and light hydrocarbons previously lost. Products of the plants are liquefied gas and elemental sulfur.

From these intensified refining processes at Poza Rica, we expect production of 12,000 barrels of gasoline and liquefied gases, and 200 metric tons of sulfur daily. Their full operation also will permit us at last to extinguish the hitherto wasteful flares.

Total cost of these plants exceeded $45 million, of which around $25 million has been spent during the past two years. These sums relate only to installations, not to transport or other facilities required. The plants also will serve the new fields discovered recently in this region.

Installation of another gas plant at Reynosa also is far advanced.

The great importance of these works lies in the fact that once they are completed, during this present year, Mexico no longer will need to import gasoline, kerosine, diesel oil and related products.

During 1954, we distributed 60,625,500 barrels of total production within the country, and exported 23,269,700 barrels. Rhythm of increase in internal distribution is high, showing the rapid industrial development of the country. National demand in 1954 was higher by more than five million barrels than that for the previous year, indicating a 9.5 percent increase. Exports rose by eight million barrels.

To take care of this internal demand effectively, we have accelerated the program of expanding storage and distribution facilities in the Republic. During the year of this report, new storage tanks with a combined capacity of approximately 20 million gallons were installed at strategic points in the country.

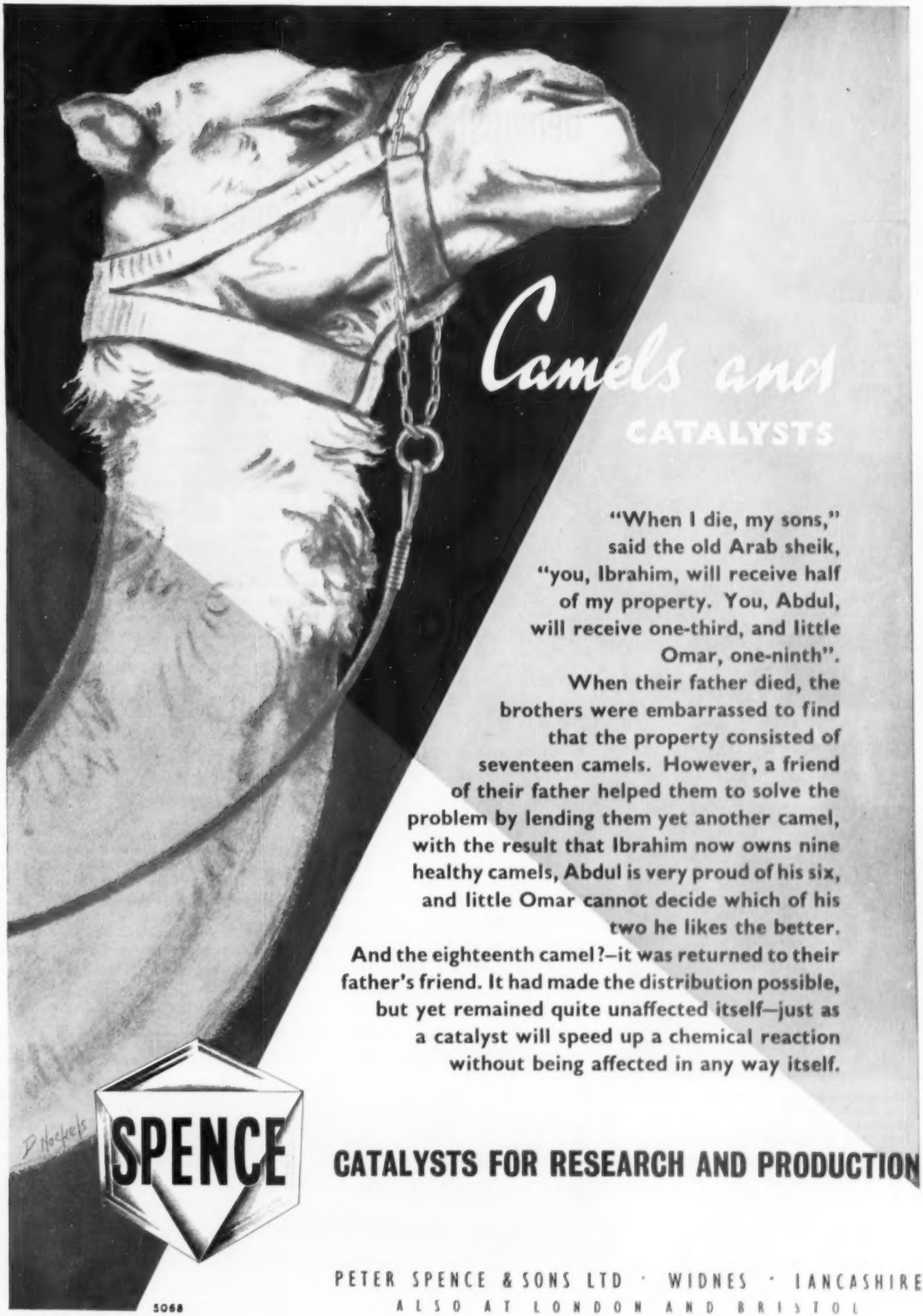
There now are 2,157 tank cars in the service of Pemex, and 334 tank trucks with capacities of 4,000 to 6,300 gallons each as compared with the 1,500- to 2,100-gallon capacities of vehicles operating in 1953. Tonnage of major and minor fleets was increased by almost 13,000 metric tons during 1954 so that the present gross tonnage of both fleets is 165,731 as against 152,796 metric tons reached in 1953.

Eighteen oil tankers are in use, with capacities reaching 1,349,500 barrels. Major and minor fleets transported a total volume of 36,568,527 barrels this past year, an increase of 29 percent over 1953.

In 1954, revenue rose to a total of $251,630,000. Salaries, wages and other payments totaled $63,280,000. Taxes and other income from federal and state governments jumped to $63,640,000. Capital investment in the industry reached $72,080,000.

During the 17 years of nationalization, proceeds from gasoline taxes levied on consumers exceeded $200 million; this revenue was placed on construction of the extensive highway network now enjoyed by the country.

It is a great satisfaction to state that Pemex' credit standing in Mexico and abroad is better each day, founded on the indisputable prestige of the institution, in the constant progress realized in its development, and in the strict fulfillment of all obligations. I publicly thank our bankers and North American manufacturers for facilities extended which have been such an important factor in the realization of our programs.


Camels and
CATALYSTS
"When I die, my sons," said the old Arab sheik, "you, Ibrahim, will receive half of my property. You, Abdul, will receive one-third, and little Omar, one-ninth".
When their father died, the brothers were embarrassed to find that the property consisted of seventeen camels. However, a friend of their father helped them to solve the problem by lending them yet another camel, with the result that Ibrahim now owns nine healthy camels, Abdul is very proud of his six, and little Omar cannot decide which of his two he likes the better.
And the eighteenth camel?—it was returned to their father's friend. It had made the distribution possible, but yet remained quite unaffected itself—just as a catalyst will speed up a chemical reaction without being affected in any way itself.
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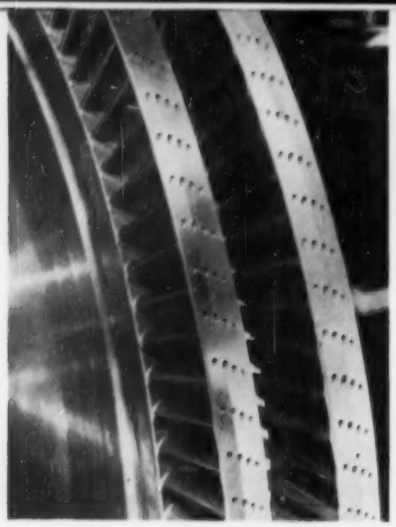


Turbine blades are firmly anchored in the wheels with "fir tree" serrations. Blades are unusually large to assure minimum leaving losses, resulting in a maximum efficiency. Blade tips are shrouded to minimize interstage losses.

Demonstrates Multi-fuel Gas Turbine for Mobile Power Generation

A NEWLY DEVELOPED gas turbine-driven mobile power plant was demonstrated July 7 by the Clark Brothers Company, one of the Dresser Industries, at its factory at Olean, N. Y. The plant was designed for the United States Navy to be used primarily for disaster replacement of normal power sources. A second unit has been sold to the Comision Federal de Electricidad of Mexico for emergency use in that country.

Mexico lacks a complete grid system for distribution of electric power and thus is peculiarly subject to emergency conditions as a result of local power plant failures. Mexico has used a mobile steam power plant such as the 10,000 kw trains built for the United States Navy during World War II, but the new Clark gas turbine unit has many advantages when compared with the older steam plant.

The wartime version of a mobile plant required a train 386 feet long with a track weight of 680 tons and a weight per kw of 75 pounds. It required makeup water for operation. Contrasted with this, the new gas turbine unit requires no water, can be housed in a single car 130 feet long with a track weight of 225 tons and a specific weight of 60 pounds per kw.

The first turbo-mobile power unit built by Clark Bros. Co. under contract to the United States Navy has a rating of 5,500 kw. The second unit, rated at 6,200 kw and being manufactured for the Comision Federal de Electricidad, will be placed in operation next spring.

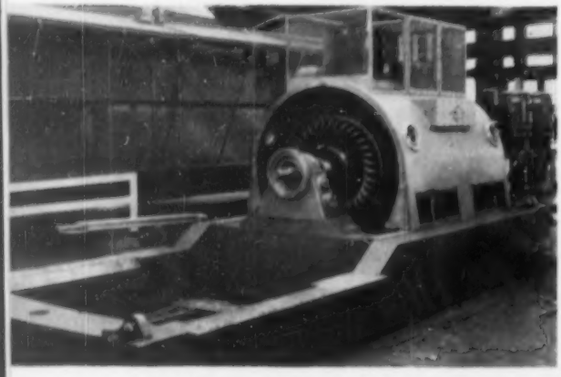
An important use for Clark turbo-mobile power plants is to meet emergencies which frequently arise from natural causes such as floods, fires, tornadoes, hurricanes, earthquakes, and many others. These natural disasters often occur suddenly and with devastating results. Power failures can often affect not only the disaster areas, but nearby areas as well. Mobile power plants, strategically located throughout such areas, could make power quickly available wherever it is needed.

In the event of hostilities, turbo-mobile power plants of this type would be well suited to be moved in on ships to base areas. In this country mobile power would be the answer to keeping key manufacturing plants operating in the event of major power failure. The essential facilities of large cities, such as water pumps, hospitals, etc., could also be kept operating.

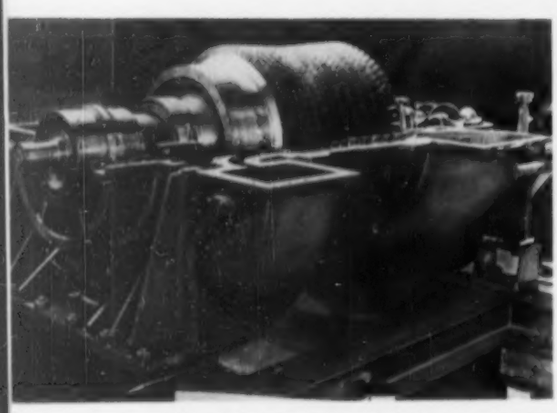
An emergency of less ghastly, though highly important nature, is meeting the power requirements of fast expanding areas. The trend toward decentralization in our rapidly growing communities can result in a distribution problem, particularly in new areas which are beyond the major power distribution system. The mobile unit will provide immediate power until the load growth warrants an extension of the major system.

The unit is designed to supply power in any area. All components are shockproof mounted and valuable alignment time at the site is eliminated. It is suitable for normal railway speeds of 60 mph.

Track preparation is unnecessary. The unit may be spotted on a siding and connected to outgoing power lines. Fuel supply

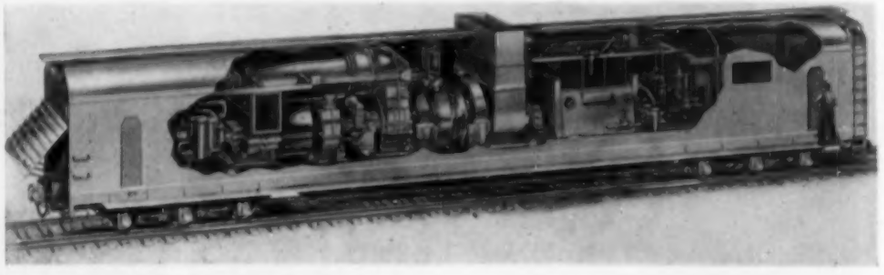


The two pole generator has been specifically designed for mobile use.



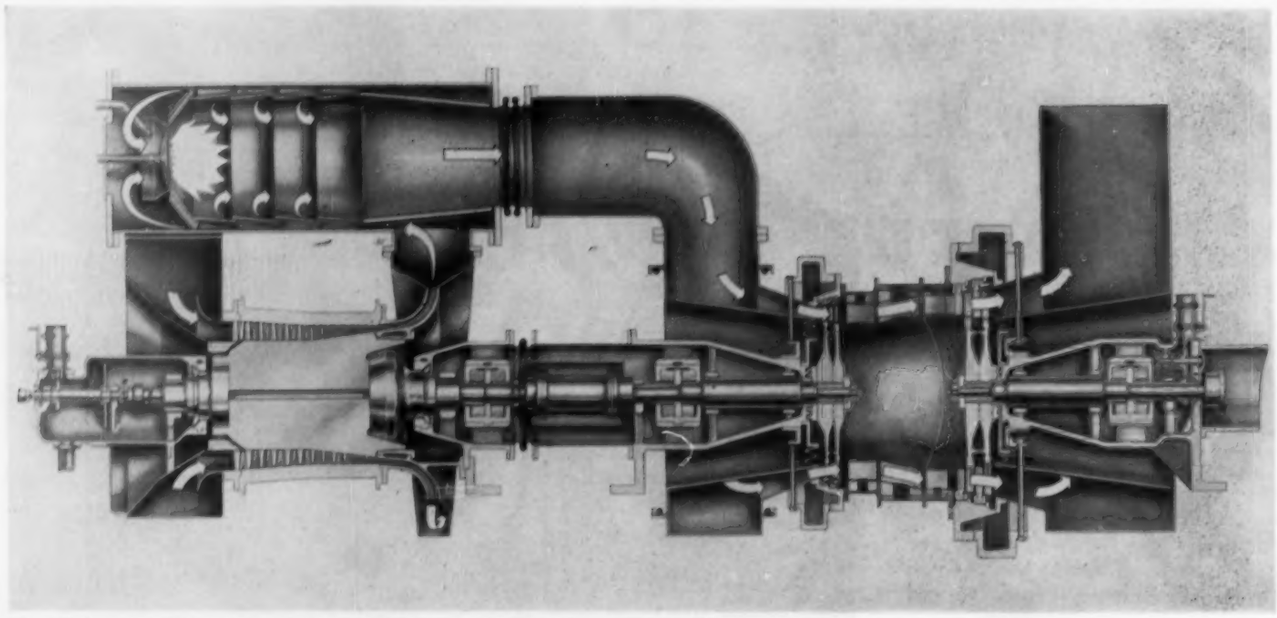
The axial compressor is of the horizontally split case design. It is a 13-stage unit designed for a pressure ratio of 4.25 and delivers an air flow of 100 pounds per second.

Cutaway showing the Clark turbo-mobile power plant mounted in a specially designed railway car. The opening on the left end of the car is for air for the lube oil coolers. The opening through the roof in the center of the car is the exhaust from the turbine.



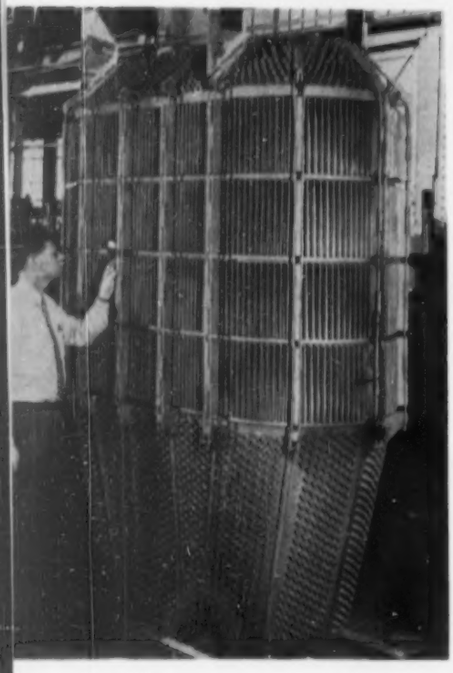
He takes oil's measure . . . He's called a gauger. He's one of the few oilmen who actually *see* oil. He works among the huge tanks where it's constantly moving in and out. His job is to keep a running check on those tanks. How much oil do they hold right now? How much came in today? What went out? Those are some of the questions he has to answer. It's a busy job, and it's an important one. He helps record how *much* oil there is—and *where* it is—every minute. Because that's one sure way *we're* sure of keeping a steady stream of Texaco Products flowing to the people who use them in all 48 states.

The Texas Company



Simplified cross section shows the flow of air and gas through the gas turbines. Air enters the azial compressor at the lower left. The 13-stage unit discharges air into the combustion chamber at the upper left where it is mixed with either liquid or gaseous fuel and burned. The hot gases enter the high pressure turbine, center, which turns this turbine and also turns the axial compressor connected to it. Next, the hot gases enter the low pressure turbine, right, which is connected to the load.

The single combustion chamber is capable of burning a wide range of liquid and gaseous fuels either individually or in combination.



is the only other connection since water and outside power are not required. The unit will be operating at full load within hours after arrival. One operator is required to start and run the plant. Control is by means of pneumatic systems. Alternately the unit may be modified for remote operation.

Inspection of all blading may be made at the job site without disturbing any major connections. The turbine, for example, may be inspected and the rotors replaced in 50 man-hours.

The power plant consists of two major elements connected by a flexible duct. The first element is the axial compressor and a turbine. The second element is a generator and a turbine. Each element is mounted on three points in the car. This assures maintaining alignment of the unit independent of the car flexure.

A large interrupting capacity main oil circuit breaker permits parallel operation of this unit with existing power systems. Fifty or sixty cycle operation is optional with a simple governor adjustment.

The combustion chamber is a highly efficient contraflow design capable of burning a wide range of liquid and gaseous fuels. The single combustion chamber used gives the simplest possible arrangement without the matching difficulties of multiple chambers. The combustion chamber can be run on any specified proportion of liquid and gaseous fuels. Three burners are provided, each having two concentric fuel sprays to assure good atomization over a wide fuel flow range. Individual burners can be shut off and withdrawn from the combustion chamber without shutting down.

Liquid or gaseous fuels may be simultaneously fired. Efficient combustion of liquid fuels is assured over the complete range of power output by the high and low capacity nozzles located in the burner. The dual nozzles are not required for gaseous fuels. Outside fuel is supplied to the 500-gallon tank by means of a transfer pump. Fuel is pumped through filters to the fuel nozzles.

Fuel flow is regulated by a pneumatic control system. Fuel pressure is controlled by a regulator which returns excess fuel to the tank.

At the Olean demonstration for visitors from New York City and the southwest, the unit was operated on heavy diesel fuel. Cost of the fuel used worked out at 1.2 cents per horsepower-hour.

Cost of the unit was placed at $150 to $170 per horsepower-hour. The Navy unit complete with rail car was just over $1 million.

G. W. Probst, vice president in charge of sales for Clark Brothers, was master of ceremonies at the demonstration. F. O. Hennig, manager of the gas turbine design department, explained the unit which was started up and operated for the visitors by L. H. Haas, chief of the test and development department. Mr. Haas operated from an enclosed control room but was visible to guests on a television monitor. Dials showing operating conditions were visible.

Units of the type demonstrated can be used for rotary drilling and other oil industry applications. Clark was a pioneer in the development of gas turbines and gas pipe line pumping service. The new design, which can operate on gasoline or heavy oils, would be suitable for oil as well as gas line service.

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FLYING A

Canadian Notes

Wins Executive Award

Leonard Y. Reed, manager of the Canadian Oil Companies Ltd. lubricating oil and grease manufacturing plant at Montreal, has won the Research Institute of America's second annual Award For Merit given for his "contribution to executive skills." A company citation also was awarded to Canadian Oil's president, W. Harold Rea, from the Institute, the world's largest business research and advisory organization. Awards are given jointly to individuals and their companies "for steadily advancing the achievement level within their operations framework."

Mr. Reed's winning entry concerned the use of a "Co-Ordinating Committee" of all department heads which handled problems beyond individual departments' limits in his plant. He was one of 200 "Key" Institute members to win the award. Companies cited are among 30,000 Institute member business firms.

Capital Requirements Heavy

More than a billion dollars of new capital will be required by the oil industry in Canada over the next five years, W. O. Twaits, a vice president and director of Imperial Oil Ltd., estimated in a recent address to the Canadian Life Insurance Officers Association.

After looking ahead to prospective developments in crude production, petrochemicals and natural gas, Mr. Twaits said he felt that the billion dollar figure might be conservative. He suggested that the rate of investment in oil and associated industries could be higher in the future than ever before. Mr. Twaits explained that, while investment in marketing and refining operations must be geared fairly closely to demand growth, input of capital in oil exploration must proceed with little regard to short-term fluctuations in the demand for finished products.

Heads Canadian Oil Co. Manufacturing

Dr. Kenneth A. West of Sarnia and Toronto has been appointed manager of manufacturing for Canadian Oil Companies Ltd. to succeed Earl A. Smith, retired. Dr. West was previously assistant manager of manufacturing.

After a broad career in the Canadian and United States oil industry, Dr. West came to Canadian Oil in 1951 as chief process engineer. In 1952, he was appointed production superintendent at the company's Sarnia refinery, and in 1954 became assistant manager of manufacturing. Dr. West is a native of Edmonton. He received his master of Arts degree from the University of British Columbia and continued his studies at McGill University, Montreal, where he obtained his Doctorate.

Dr. K. A. West

Growth in Crude Outlet Forecast

A 70 per cent increase during the next five years in the market outlet for light and medium Canadian crude oil was predicted recently by Fred G. Cottle of Toronto, manager of the transportation and supply department of Imperial Oil Ltd.

Addressing the Canadian Institute of Mining and Metallurgy, Mr. Cottle estimated that the present outlets for Canadian crude of 335,000 barrels daily would increase to 573,000 barrels daily by 1960. He pointed out that growth of the U.S. market for Canadian oil was an important factor in the increase. In regard to present debates in Washington on import restrictions, Mr. Cottle expressed optimism that both governments recognized the importance of reciprocal trade in oil.

Summarizing the market possibilities for Western crude, Mr. Cottle expressed the belief that Canadian Prairie demand would increase during the next five years by 25.2 percent, or from 123,000 barrels daily to 154,000 barrels daily. The Eastern markets are expected to increase from 129,000 barrels to 246,000 barrels daily, or an increase of 90 percent. On the West Coast, growth within the next five years is expected to reach 108.4 percent from 83,000 barrels daily to 173,000 barrels daily. He pointed out that this growth pattern, unlike past performances, does not depend upon the construction of new major transportation projects.

Mr. Cottle said that the possibilities of Western Canadian crude oil supplying the substantial refinery market in Montreal have been studied intensively and that "the economic problems involved . . . appear to outweigh by a large margin the apparent advantage of Canadian producers."

Proctor Heads CPA

John W. Proctor of Calgary has been appointed general manager of the Canadian Petroleum Association. He succeeds R. H. C. Harrison, QC, to the association's top position. Mr. Harrison has been the organization's president since 1951. The title of the association's top position recently was changed from president to general manager.

Mr. Proctor joined the C.P.A. last January as executive secretary of the Alberta division. He previously was general manager of Alberta Interfield Gas Lines Ltd.

The newly appointed general manager of the petroleum association served with the Canadian army for five years during World War II. He retired with the rank of Acting Brigadier, but following the war he served in the reserve army with the rank of Brigadier.

Mr. Harrison's resignation was effective June 30. He resigned from his present position to accept an executive position with a Calgary-based oil company which is engaged in all phases of exploration and development.

Mr. Harrison practised law in Edmonton and Leduc until he joined the staff of The British American Oil Co. Ltd. in February 1946 as the company's legal counsel. While with B.A. he served as crude oil purchaser for western Canada, vice president for B.A. Saskatchewan Pipeline Co., and public relations officer. He served with the R.C.A.F. during World War II and retired with the rank of Wing Commander.

Open Calgary Office

Thomas A. McKenzie has joined Houston Oil Field Material Co., which is opening a new directional drilling and oil well surveying office in Calgary. He formerly was general manager for Eastman Oil Well Surveying Co. Ltd. in Calgary. His background before that included experience as a drilling engineer for Shell in Venezuela, as a petroleum engineer for Mene Grande Oil Co. in Venezuela and as a drilling and drilling mud engineer in Trinidad.

Heads CPA Division

S. Douglas Turner of Calgary has been appointed manager, Alberta division, of the Canadian Petroleum Association, it is announced by A. G. Bailey, chairman of the board of directors. He succeeds John W. Proctor, recently appointed general manager of the association.

J. L. Helton

Heads Failing at Edmonton

J. L. Helton, who has been manager of the branch plant of the George E. Failing Company in Midland, Texas, since 1947, has been made general manager of the George E. Failing Supply Co. Ltd. of Edmonton, according to an announcement by J. T. Tucker, general manager of sales for the Failing Co. Mr. Halton will replace Harry Failing, who recently resigned as Failing's Canadian manager and who will move to California.

Named Failing Vice President

J. T. Tucker, general manager of sales for the George E. Failing Co. of Enid, Okla., has been named vice president of the George E. Failing Supply Co. Ltd. of Edmonton. He will continue to maintain his headquarters in Enid.

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Imperial Seismic Survey

Imperial Oil Ltd. has begun a seismic survey near Nicolet, Quebec on the south shore of the St. Lawrence opposite Three Rivers. W. A. Roliff, manager of Imperial's eastern producing division, said that the seismic work will supplement surveys carried out last year by geologists and a gravity meter crew.

To Open Sales Office in Toronto

Alan W. Bennett has joined the Davison Chemical Company Ltd. and has opened an office at 199 Bay Street, Toronto, to direct sales in Canada of Davison petroleum cracking catalysts. Opening of the new sales office follows announcement of the $6,000,000 plant for production of synthetic fluid petroleum cracking catalysts which Davison is building at Valleyfield, near Montreal.

A. W. Bennett

Spratt to Head Triad

J. G. Spratt, president of Trans Mountain Oil Pipe Line Co. of Vancouver, has been elected executive vice president and managing director of Triad Oil Co. Ltd., it is announced by E. H. Tanner, Triad president. Mr. Spratt will continue temporarily as president of Trans Mountain until a successor has been appointed.

Formerly president of Anglo-Canadian Oil Co., Mr. Spratt has spent his entire business career in the Western Canadian oil industry. He spent 12 years in government service before joining Anglo-Canadian Oil Co. in 1938 as assistant manager. Later he became general manager, vice president and managing director, and in 1953 was appointed president. He became president of Trans Mountain on January 1, 1954.

New Gas Line Planned

New British Dominion Oil Co. Ltd. and Mid Con Oil & Gas Ltd. have formed South Alberta Pipe Lines Ltd. to connect the 150 billion cubic foot gas reserve in the Etzikom field of Southern Alberta, owned 65 percent by New British Dominion and 35 percent by Mid Con, with the city of Medicine Hat, Alberta. The line will supply the gas requirements of Northwest Nitro-Chemicals Ltd., a $22 million petrochemical enterprise, for the manufacture of ammonia chemical fertilizers. The fertilizer plant is scheduled for completion in the fall of 1956.

Canadian Oil Companies Appointments

Appointments to four major company head office positions were announced recently by Canadian Oil Companies Ltd.

W. E. Wayland of Montreal was made assistant marketing manager. R. L. Beamish of Toronto was appointed sales manager. C. Grant Littlefield is now advertising manager and T. B. A. (tires, batteries and accessories) sales manager. I. Everett Barchard became marketing research manager.

J. G. Spratt

To Build Water Purification Plant

Imperial Oil Ltd., an affiliate of Standard Oil Co. (N.J.), will spend approximately half a million dollars at Imperoyal refinery to insure that water taken from Halifax Harbor and used for cooling in the greatly enlarged refinery now under construction will be returned to the harbor free of contamination.

Work will begin in two weeks on construction of a new salt water pump house and the installation of oil separating facilities with a capacity of one million barrels daily. The job is scheduled for completion by the end of this year.

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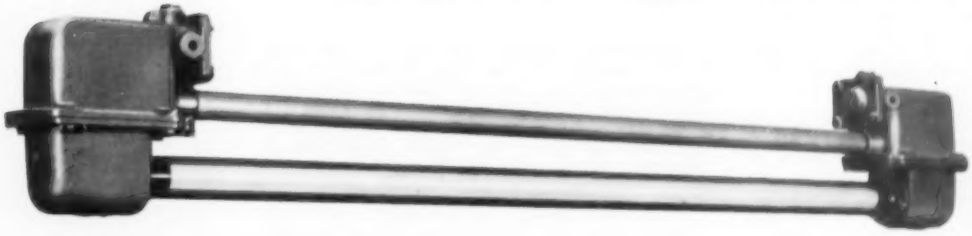

For installation in mines, oil refineries, cellulose paint and spraying shops, garages and similar sites. This fitting has a high safety margin — maximum internal pressure, due to an internal explosion, which can be reached in only about one half of the safety figure allowed. A special flameproof lamp holder and other features reduce the piling pressures usually obtained in fittings of tubular construction. Relamping is simple. A single captive bolt is slackened and the glass housing tube lowered to relamping position. Full details on request.

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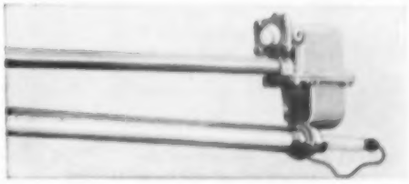


THE GENERAL ELECTRIC CO. LTD. OF ENGLAND

Oil Company Staff Changes

STANLEY L. WESTLAKE has been appointed chief engineer and F. G. White has been named division superintendent of the northern division of the Magnolia Pipe Line Co. at Oklahoma City. Mr. Westlake succeeds the late John G. Norton. Mr. White succeeds O. M. Joy, who has retired.

WILLIAM C. SOUDRIETTE of Chicago and Harold W. Torgeson of Bartlesville, Okla. have been appointed staff assistants to Wm. T. Cravens, manager of Cities Service Oil Co.'s refining division.

Mr. Soudriette's new duties as staff assistant will be primarily in the field of refinery operations and research. Mr. Torgeson's duties will be in connection with lubricants manufacture and application. Both have been with the company since 1947.

JOHN R. SUMAN, former vice president and director of Standard Oil Co. (N.J.), has been elected to the advisory committee of the board of directors of Chemical Corn Exchange Bank, New York. Mr. Suman, who has established a consulting business in Houston, Texas, since his recent retirement from Standard Oil, also will serve as special consultant to the oil and gas department of Chemical Corn Exchange Bank.

FRANK V. WILLIAMS, formerly manager of the Socony Mobil Oil Co. refinery at Olean, N. Y., has been appointed assistant manager of the lubrication and special products department of Standard-Vacuum Oil Co., New York. Mr. Williams joined Socony Mobil in 1935 at its Paulsboro, N. J. refinery. He remained there until 1945, when he was transferred to Olean.

PHILIP M. KONKEL has been appointed assistant chief geologist for The Ohio Oil Co. Mr. Konkel started with The Ohio Oil Co. in 1940 as geologist at Marshall, Ill., after five years of field experience.

H. J. HORSCH has been named manager of purchases and exchanges of products for Phillips Petroleum Co. and R. C. Pitts has been promoted to assistant general traffic manager following the retirement of T. P. Washington after 32 years with Phillips.

MARCUS A. MARKLEY and Thomas S. Horrocks have been named assistant general sales managers of Sun Oil Co. Mr. Markley has been general manager of the industrial products department since 1948 and is being succeeded by Francis F. Palmer. Mr. Horrocks has been assistant regional manager, New York region, since 1951.

QUINTON PETERS has been appointed assistant to Luther Williams, manager of public relations of Sunray Mid-Continent Oil Co. Mr. Peters has been with Benton Ferguson and Associates, Tulsa public relations counselors, and prior to that time was manager of publications for Deep Rock Oil Corp.

CHESTER H. LAUCK, Los Angeles, better known as "Lum" of the radio and motion picture team of "Lum and Abner," has been appointed executive assistant, Continental Oil Co., with headquarters in Houston. His talents will be available to all Continental departments for business meetings, civic and luncheon clubs, conventions, as an after-dinner speaker, and for other community gatherings.

RAY POWELL has been named assistant to the senior vice president of The Texas Co. He has been supervisor of process engineering in the company's refining department since 1944. Mr. Powell joined Texaco in 1931 and has served in Bayonne, N. J., and Providence, R. I., terminals; Port Arthur, Texas, and Lawrenceville, Ill., refineries; and the New York City headquarters of the company's refining department.

MARION E. DICE has been appointed assistant to the president of General Petroleum Corp. He had been manager of the company's economics department since 1944. He will be succeeded in that department by W. F. Kirk, who has been assistant manager of the economics department since 1949.

WILLIAM EWING EADIE, who has been appointed managing director of the Burmah Oil Co., has served with that company for 34 years. He is a chartered accountant by profession. Born in Glasgow, Scotland, in 1897, Mr. Eadie joined the company in 1921 and proceeded to Burma. On the formation of Burmah-Shell in 1928 he was transferred to that company as chief accountant and took up residence in Calcutta. In 1941 he was transferred to the head office in London of the Burmah Oil Co. and in 1948 became chief accountant. Two years later he joined the board as an executive director and in 1951 was appointed assistant managing director.

Mr. Eadie replaces W. E. V. Abraham, who retires at his own request from the managing directorship, but retains his directorship.

HAL F. NABORS, Houston, Texas, has been promoted to assistant general manager of Continental Oil Company's central region, with headquarters in Oklahoma City. He formerly was southern region production manager at Houston. Mr. Nabors has served in a variety of production positions for 21 years in New Mexico, Wyoming, Colorado and Texas.

PHILLIPS C. SALMAN has been appointed comptroller of Socony-Mobil Oil Co., Inc. to succeed Louis E. Hanson, who has been comptroller since 1946. Mr. Hanson is retiring. Mr. Salman joined a predecessor Socony company in 1919.

CARL F. VANDER CLUTE has been named general manager of the marine department of Gulf Oil Corp. with headquarters at 17 Battery Place, New York. He has been assistant to Willard F. Jones, vice president and general manager, who has retired after more than 50 years of service.

Mr. Vander Clute was admitted to the New York bar in 1927 and engaged in the practice of Admiralty Law until July 1, 1939, when he joined Gulf as assistant to the general manager of the marine department.

PHILIP A. NOLAN, Laurel, Montana, has been named chief chemist for Great Northern Oil Co., Pine Bend, Minn. He will head all laboratory, quality control, and testing when the plant goes into operation in August of this year. He was formerly chemical engineer at the Farmers Union Central Exchange refinery at Laurel, Mont.

W. K. WHITEFORD, JR., has been named an assistant in the land department of Falcon Seaboard Drilling Co. He will operate in the Denver-Julesburg Basin with headquarters at Denver. He previously worked for Harper-Turner Oil Co. of Oklahoma.

S. A. WOMACK, JR., of Shreveport, has been appointed geologist for Trans-Tex Drilling Co. He has been with Union Producing Co. of Shreveport since 1940.

N. L. FALCON has been appointed chief geologist of The British Petroleum Co., a position which he takes over from P. T. Cox, who since 1953 has held the dual post of exploration manager and chief geologist. Mr. Cox will continue in the appointment of exploration manager.

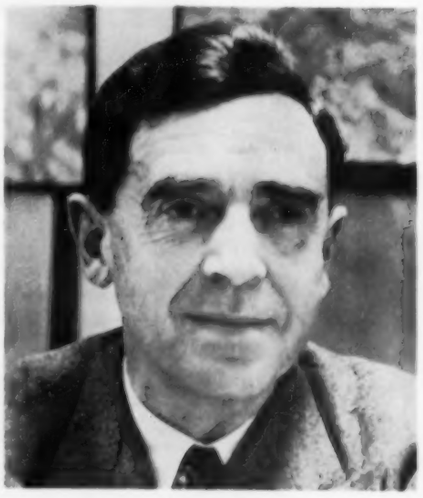
Mr. Falcon joined The British Petroleum Co. in 1927 and became manager of the company's geological division in 1953.

M. E. Dice

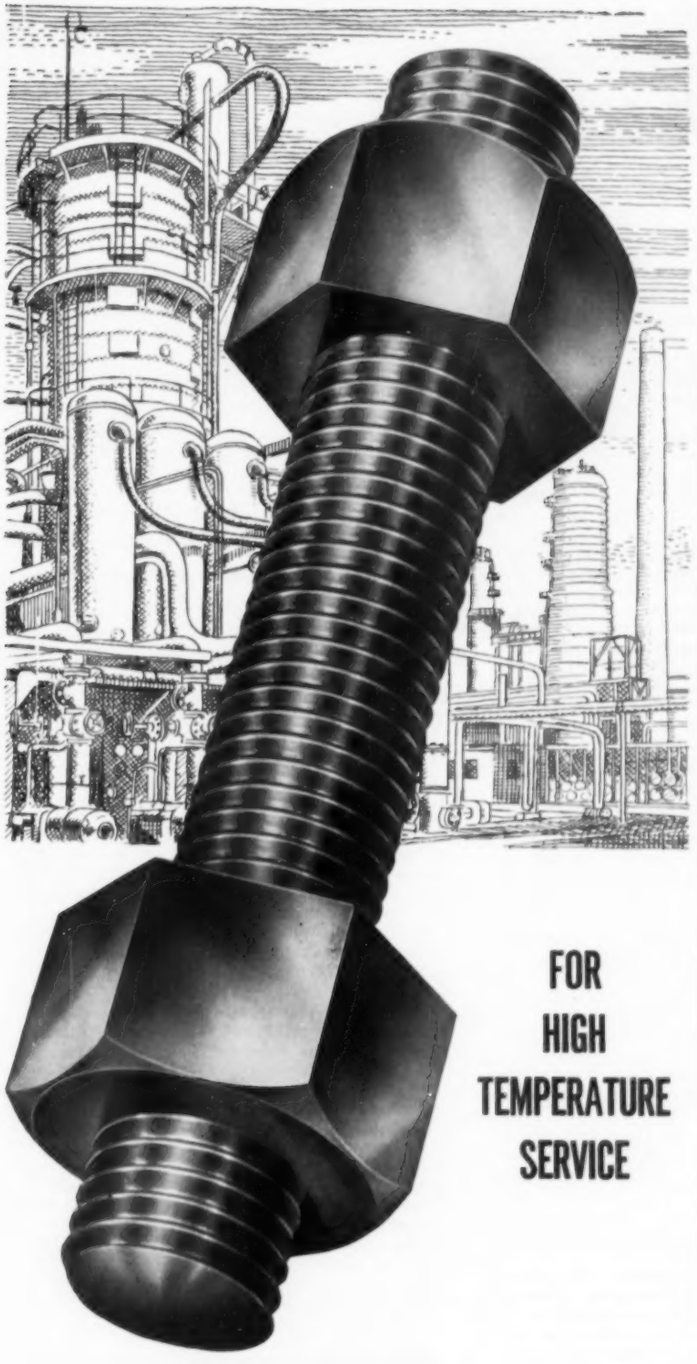
W. F. Kirk

W. E. Eadie

C. F. Vander Clute



N. L. Falcon



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Conforming to B.S.S. 1750-1951, Stud Bolts and Nuts are being supplied by Rubery Owen to all the principal Oil Companies and Refinery Equipment Manufacturers in ever increasing quantities. Special production facilities have been planned to suit every requirement to both British and American Standards with either Unified or Whitworth Threads.

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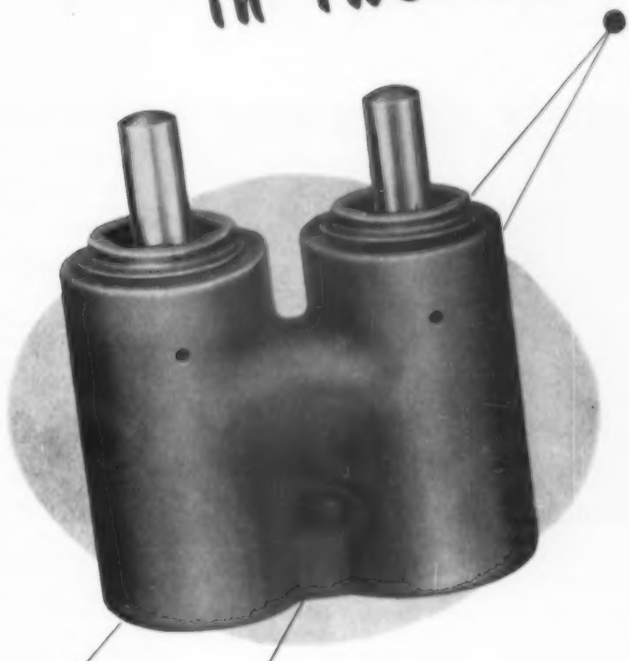

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Osborn-Ohio Return Bends for Refineries and Chemical Plant, are designed to take full advantage of the principle of Directional Solidification. For the user this means castings that give better service over a longer period.

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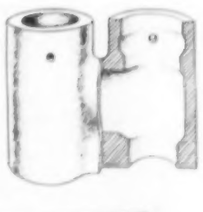
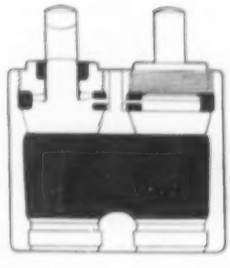


For strength at high pressure and temperatures. Detailed recommendations for particular conditions will gladly be given.



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International News and Notes

R. Hatchitt

Dresser Appoints Foreign Director

World-wide expansion of Dresser Industries, Inc., and its various operating companies and foreign subsidiaries, in step with the continued increase in foreign industrial development on all fronts and appointment of a foreign director to set up and direct an expanded overseas operations department, has been announced by J. B. O'Connor, executive vice-president.

As director of these expanded overseas operations, Dresser has named Reece Hatchitt, who formerly handled the company's foreign legal affairs. Mr. Hatchitt has been engaged in foreign and export work for 15 years and has lived and traveled extensively abroad. He was formerly associated with American and Foreign Power Co. operations in Latin America, served in the Foreign Economic Administration in Chile and has had extensive experience in both domestic and foreign sales and organization.

The executive staff of Dresser Industries, Inc. and its subsidiary companies engaged in foreign and export work met recently in New York to review world markets and program operations plans for Dresser's expansion in the foreign field.

The meeting was climaxed with a reception and buffet dinner at the New York Athletic Club given by the Dresser Companies for more than two hundred executives and representatives of Dresser's many export customers.

Referring further to Dresser's expanded foreign program, Mr. O'Connor pointed out that the company and its subsidiaries maintain 38 foreign offices and operate 15 companies engaged exclusively in export and overseas operations. The planned growth of foreign activities has already resulted in the manufacture of a larger number of Dresser products abroad. As an example, Clark reciprocating and centrifugal compressors are manufactured in Italy and England. Pacific pumps are manufactured in Holland, France and England. Roots blowers and Ideco drilling equipment are also manufactured in England and negotiations are presently under way for the establishment of additional facilities in both the eastern and western hemispheres.

"The outlook for future expansion in the foreign field for the industries served by Dresser products is excellent," Mr. O'Connor added, "and in recent years, Dresser's combined foreign sales and income has increased at a rate even more rapid than the rate of increase of foreign oil and gas production. The recent acquisition of Lane-Wells has further broadened the sphere of Dresser's overseas activities through its wholly owned subsidiary, Petro-Tech Service Company in Venezuela, the Lane-Wells Canadian Co., and a world-wide demand for Lane-Wells packers and its other products and services."

New Zealand Exploration Planned

Shell Company of New Zealand Ltd., has agreed to put one million pounds into an oil exploration program in New Zealand, it is announced by the government's Ministry of Mines. The exploration will be carried out in the Taranaki and Rangitikei districts.

Shell has signed an agreement to this end with Todd Brothers Ltd. of New Zealand, which has conducted extensive oil investigations and holds the prospecting rights. J. E. Brantly and C. Stribling Snodgrass of Washington, D.C. have been consultants to Todd Brithers.

"New Zealand offers possibilities for the discovery of oil," said Bryan Todd of Todd Brothers. "There are several areas of the country, of which Taranaki-Rangitikei is one, where the geological requirements for the occurrence of oil in commercial quantities may be found. Thick marine sediments as source beds, porous formations that could serve as reservoirs and structures which could permit accumulations exist in these places.

"Though some exploration work has been done in the past, pricipally during a period before the second World War, new ideas and greatly advanced techniques for exploration and for recovery of oil have been developed since that time.

"Additional important geological work has been done which throws new light on certain critical problems and upon a review of these recent developments we have felt that the possibility of the discovery of oil in New Zealand should be reassessed."

At present, New Zealand petroleum production is about 1,000 tons a year, against requirements of 1,250,000 tons a year. For years, Taranaki has been a hunting ground for crude petroleum, and the first well was dug by spade 89 years ago in the port area of New Plymouth. Since then, 57 wells have been sunk in the district, and 25 have produced oil, most of the rest natural gas. The quantities, however, were not up to hopes.

Between 1938 and 1944, New Zealand Petroleum Co. Ltd. spent more than a million and a quarter pounds on exploration in the district and on the east coast of the North Island. This was the last major oil quest in Taranaki.

International Petroleum Transfers

Mark F. Nero is being transferred from International Petroleum Co. Ltd. in Talara, Peru to International Petroleum (Colombia) Ltd., where he will be assistant manager of the exploration department, with headquarters in Bogota. Mr. Nero has been with International Petroleum Co. Ltd. in Talara since September 1952.

J. D. Tuohy, assistant manager of the exploration department of International Petroleum (Colombia) Ltd., has been transferred to Talara, Peru as head of the geological department. Before joining International Petroleum Co. Ltd. and its subsidiaries in September 1952, Mr. Tuohy had worked in Venezuela with Standard of Venezuela and Creole, and during World War II served in the U. S. Navy as navigator and co-pilot.

New Ocean Terminal

Standard-Vacuum Oil Company's new ocean terminal at Chittagong will greatly facilitate the distribution of petroleum products throughout East Pakistan.

Storage capacity for 13 million gallons of seven major products is being provided.

Standard-Vacuum is considering a river terminal at Khulna. Products required for distribution inland will be shipped by railroad and river transport from Chittagong to Narayanganj for distribution to outlying areas. The river terminal at Narayanganj is equipped with tankage and warehouses to store all major products.

Kuhl Heads Abadan Refinery

Paul E. Kuhl, assistant general manager of manufacturing of the Esso Standard Oil Co., has been named general manager of the Abadan refinery on a two-year loan assignment to the Iranian Oil Refining Co.

Mr. Kuhl joined the company in 1926 and subsequently served as assistant superintendent of the Aruba refinery, associate manager of Standard Oil Development Company's process division and assistant manager of East Coast manufacturing. He served for one year as director of foreign refining for the PAD.

German Co. to Manufacture High Octane Catalyst

The Atlantic Refining Co. has announced that Kali Chemie, A.G., of Hanover, Germany, has been licensed to manufacture catalyst for use in the Atlantic Catforming process for making high octane gasoline. Kali Chemie will install new facilities in its catalyst plant at Neinberg, Germany, for the production of Atlantic's KRC-14 catalyst.

Plan Iranian Products Line

Williams Brothers of Tulsa, often a mountaineer of the pipe line contracting business, recently gave technical advice to a British engineering firm that soon will build one of the highest pipe lines in the Eastern Hemisphere.

Williams officials recently were hosts to four representatives of Costain-John Brown Ltd. The internationally known firms discussed plans for the Trans-Iranian pipe line.

Costain-John Brown will construct 337 miles of the pipe line on the southern end, involving an estimated cost of $18.2 million. Total cost of the 573-mile line will be about $32 million. The line will rise from about 60 feet above sea level at Ahwaz to 7,000 feet in the Zedran mountains.

Entrepose, a Paris engineering firm, will construct the northern end of the line.

An eventual capacity of 30,000 barrels a day will be put through the line to move products to Teheran from the refinery at Abadan. A line from the refinery at Abadan to Ahwaz is already in existence and Costain-John Brown will extend the pipe line from Ahwaz north to Azana. There the French firm will take over the construction of the remainder of the line into Teheran.

Officials of Williams Brothers Co. and Costain-John Brown Ltd. are exchanging technical information on the construction of the Trans-Iranian pipe line. Checking route of the products line, left to right, are: F. R. Kelly, C-JB consultant; David Williams, Williams vice president; R. Riley, C-JB. instrumentation engineer; B. E. Barnes, Williams vice president; and C. M. Collins, chief engineer for Williams.

Caltex Film Series Produced

"The New India," a 16mm, 25-minute documentary film produced by the California Texas Oil Co. Ltd., is the first in a series of Caltex public relations films designed to promote understanding among nations. One purpose of these films, each devoted to one nation, is to show how its people live and work, to tell of their traditions and aspirations. "The New India," for instance, will not be shown primarily in India, but in other countries, with the sound track in the local language.

Other documentaries in this series are being completed on Norway and France. Plans are in progress to make at least 10 more individual film subjects of this type on other countries in the Caltex Group. The Caltex Group of 94 member companies is engaged in oil field exploration, production, transportation, refining, distribution, and marketing of petroleum products. Affiliated companies of the Caltex Group operate in 67 countries of the Eastern Hemisphere.

Catalytic Oil-Gas Plant For Germany

The Power-Gas Corporation Ltd. of Stockton-on-Tees has reported that its German licensee, Didier-Kogag-Henselmann GmbH, Essen, has received an order for the installation of an 850,000 cubic feet per day "Segas" catalytic oil-gas process plant for the Gas Works of Hamelin, Germany. This is the same British process installed in the Kent refinery of British Petroleum Co., which was evolved in the laboratories of the South Eastern Gas Board in conjunction with Power-Gas Corp.

The process is designed to produce from a varied range of oils, a gas with a calorific value, specific gravity and combustion characteristics similar to those of coal gas, and is interchangeable with it. The plant can also be used for reforming liquefied petroleum gases.

The plant to be erected in Germany will be cracking heavy grades of oil and is due for completion before the end of the year.

To Drill in Sicily

Mediterranean Oil Co. expects to drill an additional well on its Sicilian "Comiso" permit in the early part of next year, according to a report by R. S. Macmillan, president of Macmillan Petroleum Corp., to stockholders at the corporation's annual meeting. Macmillan owns 35 percent and Gulf Oil Corp. 65 percent of Mediterranean Oil Co. and Macmillan will bear its proportionate share of the well's drilling cost. Prior to drilling on "Comiso," it is expected that two additional wells will be drilled adjoining this permit by Gulf Oil Corp.

Exploration in Nigeria

A deep exploration well is being drilled in the Onitsha province of the eastern region of Nigeria by the Shell-D'Arcy Petroleum Development Co. of Nigeria, a joint enterprise of The British Petroleum Co. and Royal Dutch/Shell groups. Located at Akukwa, the new well marks yet another stage in the search for oil under Nigerian soil.

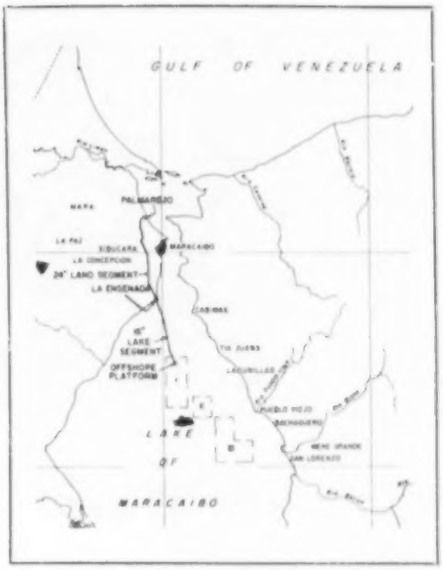
The drilling unit being used on the new well is the rig that recently completed a deep exploration dry hole near Benin City.

Buys 140-Foot Spud Drilling Barge

Mene Grande Oil Co., Maracaibo, Venezuela, has awarded a contract to Levingston Shipbuilding Co. for a 140-foot spud drilling barge. This special vessel was designed by Friede and Goldman, Inc., naval architects and marine engineers of New Orleans. It is self elevating by means of hydraulically operated spuds and will be used to drill in the open waters of Lake Maracaibo.

Orders Gas Turbines

Creole Petroleum Corp. has ordered 12 Westinghouse gas turbines for its proposed new repressuring plant to be built on a platform in Lake Maracaibo. Each turbine will have a 7,000 hp rating. The plant will compress 390 million cubic feet of gas daily to 1,800 psi for formation injection. Operations will begin early in 1957.



Shell of Venezuela Completes "Lap Line"

Compania Shell de Venezuela has completed "Lapline," a 45-mile crude line from an offshore platform in Lake Maracaibo to the company's loading terminal 12 miles north of the city of Maracaibo. Capacity is 100,000 b/d.

The first 18½ miles is laid on the lake bed between La Ensenada and a floating platform at the concession, where the depth is 70 feet, and the remaining 26½ miles from La Ensenada to Palmarejo is laid overland.

The laying of the underwater line, which is composed of 16-inch seamless pipe supplied by Stewarts & Lloyds, was carried out on contract by Brown & Root, starting from the shore end and using a converted LST as a lay barge. Before laying, the 40-foot lengths of pipe were coated against corrosion, and were then covered with a 1½ inch thick concrete sheath to within 15 inches of the ends to provide negative buoyancy and as a protection against marine borers. After welding, these spaces were coated and wrapped and then surrounded by metal jackets which were filled with concrete. The actual submarine operation was completed in 77 days.

The land section is of 24-inch buttweld pipe supplied by the South Durham Steel & Iron Co., the laying contractors being Anderson Brothers. This line was laid overground except at road and rail crossings. Here the sections were coated, wrapped and buried. In places where the soil resistance survey indicated the possibility of corrosion, the land line was placed on 10-inch high concrete blocks.

Design and engineering work on Lapline was carried out by Shell Pipeline Corp. of Houston, Texas, and Shell technicians supervised the whole of the operations. After completion the land length was tested to 800 psi and the underwater line to 1,000 psi.

Tanker Steered by Propeller

An unusual ship launched recently in England was the "BP Haulier," first of a fleet of nine tankers being built for Shell-Mex and B.P. Ltd., the distributing organization in England of the British Petroleum and Shell groups. The tankers will be used for carrying products along the river estuaries around Britain.

"BP Haulier" is the first tanker to be equipped with a Voith Schneider propeller, which steers as well as propels the ship and eliminates the necessity for rudder mechanism. The blades can be feathered to give thrust and manipulated to give forward or reverse motion. These features will help the "BP Haulier"—148 feet long and with a cargo capacity of over 2,000 barrels of petroleum products—to negotiate the limited waterways with sharp bends on which she will sail between refineries on the Medway and Thames estuaries and various depots.

New Caltex Tanker Building

The keel of a new 32,000 dwt supertanker was laid June 6 at the Wilton-Fijenoord yard in Schiedam, Holland for N. V. Nederlandsche Pacific Tankvaart Maatschappij, one of the Caltex Group of 94 companies operating in 67 countries of the Eastern Hemisphere.

This vessel will increase the Caltex Dutch fleet, which is engaged mainly in the transportation of crude oil to Pernis, Holland, to seven owned tankers totalling over 131,000 dwt.

Three other tankers now under construction or contracted for will increase the Caltex Group owned tanker fleet to 62, with a total deadweight tonnage of approximately 950,000 tons. Under its postwar construction program, the Caltex Group has already received delivery of 17 tankers.

Venezuelan Discovery

Venezuelan Petroleum Co. has successfully completed a wildcat discovery, Aguasay #1, about 2¼ miles northeast of the Greater Oficina producing area. Production was found at two horizons: 12,495 feet to 12,500 feet and between 11,994 feet and 12,032 feet. On short initial tests the well flowed at rates ranging from 720 to 1,019 barrels daily from the lower formation and at a rate of 803 barrels daily from the upper formation. Both tests were on a ¼-inch choke and the oil of 27.1 gravity. The well will be dually completed from the two zones.

Venezuelan Petroleum Co. has a sizable block of concessions located to the north of the well, but additional development is required before any estimate can be made as to the extent of the possible productive area.

Proposes Name Change

Stockholders of Societe des Raffineries de Petrole de la Gironde, French affiliate of the Caltex Group, have applied to change the company's name to Caltex S.A.F. The new name must have the formal approval of the French Government.

Jean Lucet, president and general manager, said the change was in keeping with a policy "to standardize the names of the different companies of the Caltex Group throughout the world."

The Caltex Group is composed of 94 companies doing business in all phases of the petroleum industry in 67 countries of the Eastern Hemisphere. Caltex S.A.F. is engaged in marketing, and operates a 16,500 b/d refinery at Bec d'Ambes. The main office is in Paris.

Pakistan Gas Discovery

Natural gas has been discovered at the deep test well being drilled by Pakistan Petroleum Ltd. at Haripur, 13 miles from Sylhet town (East Pakistan). With the well at 7,800 feet, evidence of gas was found and 10¾-inch steel casing was cemented at 7,727 feet. Gas subsequently broke through the surface of the ground in several craters about 200 yards from the well, one of the craters catching fire. Well equipment is undamaged and the gas in the well itself is under control. Efforts to control cratering are in progress.

New Pipe Line to Tripoli

Iraq Petroleum Company has announced the construction of a pipe line of 24-inch diameter connecting with the port of Tripoli on the Mediterranean. The new unit will leave the main line of the system at a point near Homs and will be 72 miles in length. It will have a yearly capacity of 68 million barrels. New loading facilities are being provided at Tripoli to take care of the additional tonnage.

Elected to Westinghouse European Post

J. H. Compton has been elected vice president of the Westinghouse Electric Co. of Europe. Formerly assistant to the president, Mr. Compton has been stationed in London since 1951. He will now reside in Paris.

Grangemouth Expansion

British Petroleum Chemicals Ltd., a joint enterprise of British Petroleum Ltd. and The Distillers Co. Ltd. which commenced operations in 1951, will spend £8 million for expansion of the Grangemouth plant.

The primary process in this plant is the cracking of a special petroleum fraction supplied by the adjacent Grangemouth refinery of the British Petroleum Co. Ltd. to produce ethylene and propylene.

Ethanol is produced directly from ethylene by combination with water in the presence of a catalyst, a patented process of the Shell Company, and is sold as such for general chemical purposes. Propylene is at present being used for the production of iso-propyl alcohol.

A certain amount of ethylene is delivered to the adjoining plant of Forth Chemicals Ltd. (an associate of B. P. Chemicals) where it is used in the production of styrene monomer, the raw material from which polystyrene is made.

One of the constituents of the liquid fraction for the cracking plant provides the crude stock for a polymerization plant in which dicyclopentadiene is made. This is sold for use primarily in the manufacture of synthetic drying oils for the paint industry and also in the preparation of insecticides.

The proposed extensions include:

(1) A duplication of the cracking and the gas separation plants. The extra amount of ethylene produced will satisfy the needs of the various associated plants and also a margin for supply to other users of ethylene.

(2) A new unit to treat the C_4 stream from the two separation plants for separation of butadiene, which will be used in the preparation of synthetic rubbers, etc.

(3) Duplication of the existing ethanol plant, giving increased ethanol production.

(4) A new tetramer plant for the polymerization of propylene to tetrapropylene, which will provide the feed for a new detergent alkylate plant in which tetrapropylene and benzene are converted to dodecylbenzene by a catalytic process in the Grange Chemical Co.'s plant.

The original (1951) plant of British Petroleum Chemicals was designed and constructed by Stone & Webster Engineering Corp. and its U.K. affiliate, E. B. Badger & Sons Ltd. Contract for the design and construction of the extensions has been placed with Stone & Webster, with the exception of the butadiene separation plant which will be built and engineered by the Kellogg International Corp.

All plants are scheduled for completion between June 1956 and June 1957.

The Grange Chemicals plant is also being designed and built by Stone & Webster and is scheduled to come on stream in the last quarter of 1955.

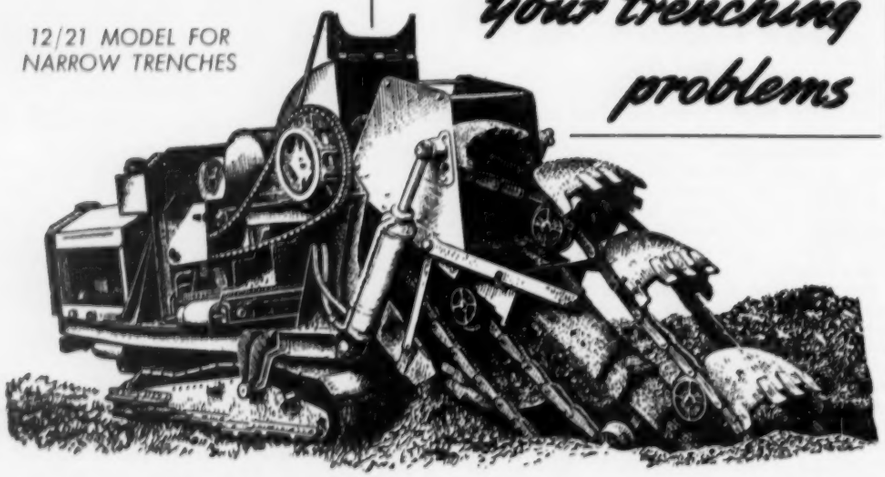
The major portion of the above equipment will be purchased and fabricated in the U.K.

All off-site facilities are being designed and constructed by The British Petroleum Co. Ltd., which is managing the whole project.

Steam and electricity will be provided, as at present, from the Grangemouth petroleum refinery, and increased facilities for this service are being provided.

The answer to all your trenching problems

12/21 MODEL FOR NARROW TRENCHES

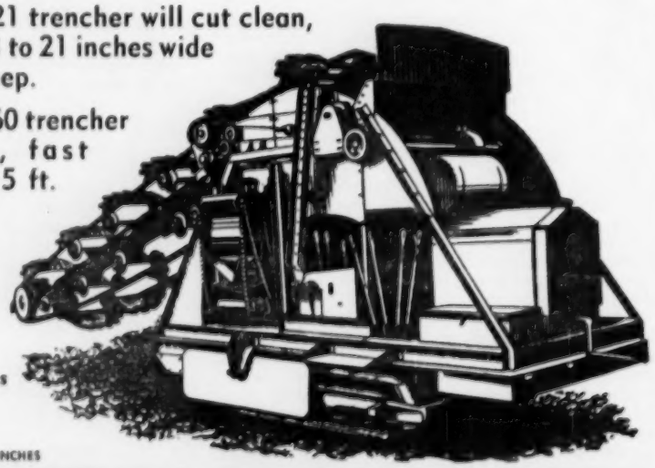


ALLEN *Super Duty* TRENCHERS

World-renowned, all-British ALLEN plant is recognised as the finest obtainable. For hard work, long life, freedom from breakdown and economical maintenance, it has no equal anywhere.

The Model 12/21 trencher will cut clean, fast trenches 13 to 21 inches wide down to 6 ft. deep.

The Model 16/60 trencher will cut clean, fast trenches up to 5 ft. wide down to 14 ft. deep.



Illustrated catalogues sent on request.

16/60 MODEL FOR WIDER TRENCHES

JOHN ALLEN & SONS (OXFORD) LTD. COWLEY OXFORD ENGLAND

New Lube Oil Plant For Iraq

Foster Wheeler Ltd. has been awarded a contract by the Iraq Government for the design, supply and construction of £3 million lube plant in Iraq to produce 25,000 metric tons a year of high grade lubricants.

The plant will be erected in conjunction with the Government's present refinery near Baghdad and will consist of a vacuum distillation unit; propane dewaxing and de-asphalting units, along with a propane production plant; a furfural solvent refining unit; acid treating and clay percolation finishing units; drum and can making and filling plants; water treating, cooling tower, tankage and off-site facilities.

British Discovery

Oil has been discovered in the first well drilled by The D'Arcy Exploration Co. at Egmanton in Nottinghamshire, England. The new discovery is six miles from the company's oilfields at Eakring, which last year produced about 430,000 barrels of oil. A show of good quality oil occurred at around 3,200 feet in the same sand formation below the carboniferous limestone from which oil is produced at Eakring.

Refueller

The Steel Barrel Co. Ltd. of Uxbridge, England, has designed a new fueller for the Esso Petroleum Co. Ltd. for fuel oil and water methanol aircraft service. Overall height has been restricted to six feet so that it can be driven under the wings of the majority of aircraft. Delivery controls are located in the driver's cockpit.

Delivery rates are 12 gpm for lubes and nine gpm for water methanol.

New Enamel

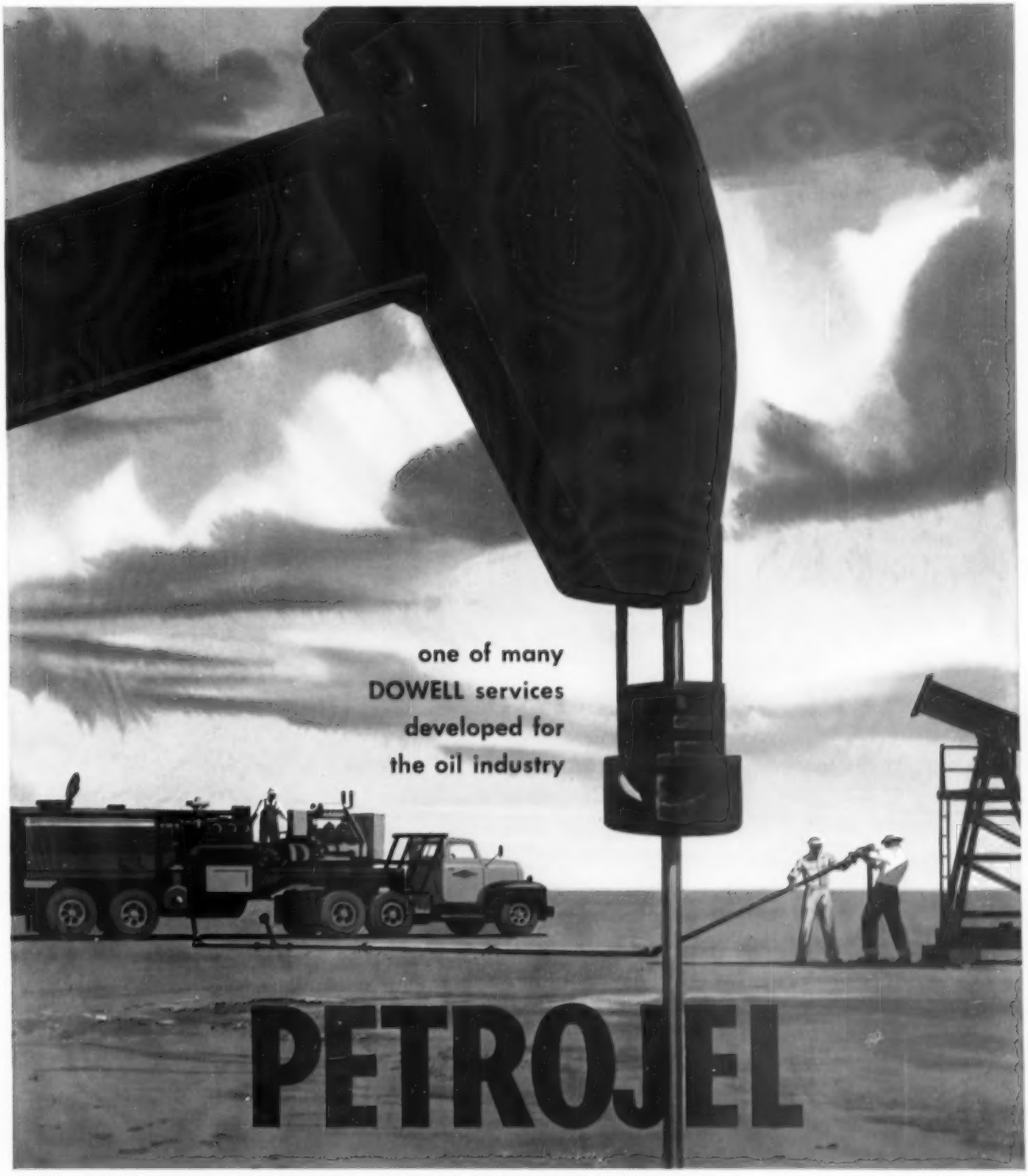
International Paints Ltd. are now marketing a new "Epikote" based enamel, Group 37, which on air-drying has properties similar to a stove enamel.

It is suited for use on chemical plants, bottle washing machines, etc. as well as on road, rail and marine tankers. It can be applied by brush or spray on wood, metal or concrete and under normal conditions is touch dry in four to six hours.

Wayne C. Yeager

Wayne C. Yeager, 72, former director, vice president and general manager of sales of The Atlantic Refining Co., died on July 3 at Allentown, Pa.

Mr. Yeager had served with Atlantic for 53 years at the time of his retirement in 1949. He started his career with the company in 1896 as an office boy at the age of 14 in his home town in Reading, Pa. He became a director in 1930, vice president and general manager of domestic sales in 1935 and general manager of sales in 1947.



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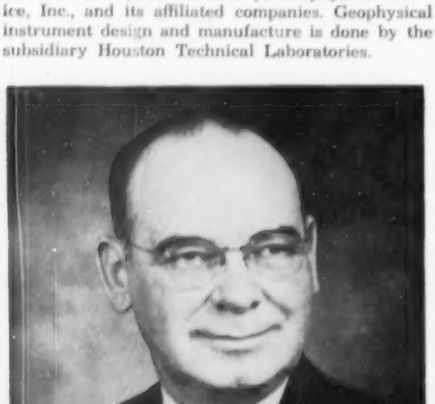
Opens District Sales Offices

Texas Instruments, Inc., is opening a Los Angeles sales office at 1741 Ivar Avenue as the first step in establishing marketing headquarters throughout the U.S. The 25-year-old electronics firm previously marketed its products and services mainly with the aid of sales representatives based at company headquarters in Dallas and with only a few specialized representatives in the larger cities. The new district offices will be staffed with representatives of Texas Instruments' manufacturing divisions.

Western district office personnel will include William J. Brugman, semiconductor products division; W. M. Montgomery, Jr., components division; and Rex Welch, apparatus division.

Texas Instruments started in business in geophysics and during recent years also has become a manufacturer of electronic components, equipment and systems for both commercial and military use.

Texas Instruments is the largest producer of transistors of all types, the largest commercial source of germanium radio transistors, and the only commercial source for the high temperature silicon transistors that promise to miniaturize airborne electronic equipment. TI also produces transformers, resistors and delay lines and complete airborne electronic systems. The company has over 2,400 employees and 15 subsidiaries, and operates throughout the free world. Petroleum exploration is conducted by the subsidiary, Geophysical Service, Inc., and its affiliated companies. Geophysical instrument design and manufacture is done by the subsidiary Houston Technical Laboratories.



E. C. Kirby

Appointed Ideco Representative

Ed C. Kirby has been appointed technical service representative for Ideco, one of the Dresser Industries, Dallas. Mr. Kirby has been associated with petroleum equipment manufacturers and suppliers for 30 years. For the past 17 years he has represented the Regan Forge and Engineering Co. in 20 states east of the Rockies. He will specialize in supplying Ideco Fabriform Sheaves to original manufacturers. His headquarters are in Houston.

Celebrates 75th Anniversary

Henry Vogt Machine Co. recently celebrated its 75th anniversary with a special program at the memorial auditorium in Louisville, Ky. Congratulatory addresses were made by Mayor Andrew W. Broaddus and John R. Carpenter, president of the Louisville Chamber of Commerce. Responses were made by company officials and service pins presented to employees. Four men have been continuously employed by Vogt for 50 years, five for 45 years, 37 for 35 years and 129 for 25 years.

G. A. Heuser, one of the 50-year employees, has been president of Vogt since the death of its founder, Henry Vogt, in 1936. The company was organized as a small machine shop in 1880 and now ocupies a 24-acre plant producing steam generators, heat transfer equipment, pressure vessels, refrigeration equipment and valves and fittings for the petroleum and other industries.

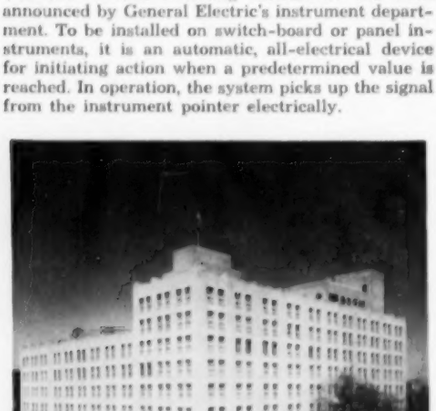
The story of petroleum, from its origin in the earth millions of years ago to its emergence through man-made wells for countless uses in today's mechanized world, is interpreted dramatically in The American Museum of Natural History's new Hall of Oil Geology at New York. A 25-foot scale model of an oil drilling rig is a part of the exhibit. Inspecting the model rig (left to right) are: Arthur T. Proudfit, a director of Standard Oil Co. (N.J.), Alexander M. White, museum president, and Dr. Albert E. Parr, director of the museum.

Cities Service Gas Plant in Operation

The new 21 million cubic foot West Seminole natural gasoline plant of Cities Service Oil Co. (Del.) and others in Gaines County, West Texas is in operation. Cities Service is operator for Atlantic Refining Co., Burdel Oil Co., Magnolia Petroleum Co., Superior Oil Co., Sinclair Oil and Gas Co., Shell Oil Co. and Great Western Drilling Co. Guy W. Duren, Jr., of Blackwell, Okla., is superintendent of the new plant.

Control Initiating Instrument

A new control initiating instrument has been announced by General Electric's instrument department. To be installed on switch-board or panel instruments, it is an automatic, all-electrical device for initiating action when a predetermined value is reached. In operation, the system picks up the signal from the instrument pointer electrically.



The Ohio Oil Company has recently enlarged its general office building to complete a three-year expansion program in the Findlay, Ohio area. New construction at the Donnell Building includes an eight-story east wing, addition of two floors to the original six-story south wing, and the extension of that wing to complete a square O-shaped structure covering one quarter of a city block.

Rubber Plants Transferred to Esso

The first transfer of a synthetic rubber plant to private ownership under the Rubber Producing Facilities Disposal Act of 1953 took place April 21 when Esso Standard Oil Co. paid the federal government $16 million for butyl rubber units the company has operated for the government since 1942.

Since 1937, Esso Standard and other affiliates of Standard Oil Co. (N.J.) have spent more than $14 million on the development of butyl rubber, from which nearly all American passenger car inner tubes are now made. The Baton Rouge plants have a capacity to produce approximately 47,000 tons of butyl out of a total 90,000 tons capacity in the U. S. per year.

New Horizons

The Lummus Company has published a new process handbook for the oil industry under the title "New Horizons." The handsomely cloth-bound book of more than 100 pages is available on request to the company at 385 Madison Ave., New York 17.

The book describes 47 petroleum, petrochemical and chemical processes. Most have complete and easy to follow flow diagrams containing typical operating data. Accompanying text discusses technical, economic and other phases of each process and of each group of processes. The first part of the book gives the background, organization and facilities of The Lummus Company.

Fletcher Devin

Cooper-Bessemer Elects Devin Vice President

Fletcher Devin has been elected a vice president of The Cooper-Bessemer Corp. For the past 20 years Mr. Devin has directed the development of Cooper-Bessemer's locomotive markets. He is also district sales manager for the territories of Ohio, Kentucky, Michigan, West Virginia and Tennessee for engineering and sale of Cooper-Bessemer engine-driven compressors used in gas pipe line transmission and in refinery service.

Erratum

The Editors of World Petroleum regret that, in the article "Three Years Financial Review of United States Oil Companies" on page 45 in the July issue, there were several errors in statistical information for the Standard Oil Co. of N. J. In the column headed "Net Capital Assets," the figure for 1953 should be $3,019,828,000. The 1952 figure should be $2,787,285,000. Under the column headed "Funded and/or Long Term Debt," the 1953 figure should be $531,749,000 and the 1952 figure should be $502,-872,000.

Smith Retires from Chicago Bridge

Milo E. Smith retired from Chicago Bridge & Iron Co. on July 1, 1955 after 33 years with the company. He served as advertising manager from January 1, 1926 to July 20, 1954.

New Hydrocracked Jet Fuel

A new jet fuel to meet critical demands of supersonic aircraft has been developed by Socony-Mobil Research and Development Laboratories, Paulsboro, N. J., the Society of Automotive Engineers was told at its recent annual meeting in a paper by D. P. Heath, C. W. Hoffman and J. H. Reynolds.

Manufactured by a new "hydrocracking" process, the new product is better than JP-5 jet fuel. The Paulsboro laboratories are preparing several barrels of the new fuel, produced in a pilot-scale hydrocracking unit, for delivery to the military for evaluation.

Jet fuel produced by hydrocracking, Mr. Heath said, retains its stability for relatively long periods at temperatures in the range of 400 to 500°F. With the use of a new additive, developed by Socony Mobil, hydrocracked fuels can be further improved for "far greater stability" than is believed to be required for supersonic aircraft. Properties of the hydrocracked fuels are compared with U. S. Air Force specifications in the following tabulation:

PROPERTIES OF HYDROCRACKED JET FUELS

	JP-5		JP-4	
	Test Fuel	Federal Specification MIL-F-5624B	Test Fuel	Federal Specification MIL-F-5624B
Gravity, °API	45.6	35 min. 45 max.	51.5	45 min. 55 max.
ASTM Distillation, °F				
10% Evaporated	360	400 max.	205	—
20% "	381	—	293	270 max.
50% "	416	—	363	370 "
90% "	499	—	428	470 "
End Point	521	550 max.	451	—
Smoke Point, mm	31	20 min.	28	—
Smoke Volatility Index	—	—	59	54 min.
Aromatics, Vol. %	4	25 max.	6	25 max.
Olefins, Vol. %	1	—	1	—
Aniline-Gravity Product	7,240	4,500 min.	7,360	5,250 min.
Net Heat of Combustion, Btu/lb.	18,700	18,300 min.	18,700	18,400 min.
Sulfur, Wt. %	0.002	0.4 max.	0.002	0.4 max.
Freezing Point, °F	−53	−40 max.	< −76	−76 max.

Silica Gel for Gas Dehydration

The practicability of using silica gel for natural gas dehydration has been shown in more than a year of field tests, it was announced by the Davison Chemical Co. Division of W. R. Grace & Co., which supplied the silica gel for evaluation at the Carthage, Tex., gasoline plant of the United Gas Pipe Line Co. A coarse granular (3-8 mesh) pre-attrited type of silica gel was developed for this purpose, at a price which makes its use economical, the announcement said.

The gas stream at the Carthage plant is first passed through an oil absorption tower to remove gasoline and then through a twin-tower dehydration unit containing 5,500 pounds of silica gel per tower. The gas emerges from the oil absorber tower saturated with water vapor and is dried to an average dew point of less than −14° F. The towers remain on stream until the gas moisture content reaches 4 lbs. mmscf, a period of about 50 hours in the early part of the operation. Then the silica gel is regenerated by a reverse flow of hot natural gas for six to ten hours.

P. C. Kreuch

E. F. Foubert

Rockwell Elects Two Vice Presidents

Paul C. Kreuch, assistant to the vice president in charge of Rockwell Manufacturing Company's meter and valve division, has been named a vice president in that division, and Eugene F. Foubert, manager of industrial relations for the company, was named vice president, industrial relations.

Heads Unit Rig Sales

J. L. Vint, Jr. has been appointed vice president of sales for Unit Rig and Equipment Co., Tulsa. He was formerly vice president of engineering and succeeds J. T. Tucker, who recently resigned to join Westinghouse Airbrake. Ed A. Lyle has been made chief engineer. He formerly was chief project engineer.

J. L. Vint, Jr.

E. A. Lyle

Sealed bids for the purchase of 250-ton Floating Crane U.S. AJAX and one lot of spare parts, offered for sale under Invitation 179 by Panama Canal Company will be received until 10:30 AM Eastern Standard Time September 30, 1955. The U.S. AJAX, still classed as one of the largest floating cranes of its type, was manufactured by Deutsche Maschinenfabrik A.G. of Duisberg, Germany and floated to the Canal Zone in July, 1914, on a trip which took 74 days. The general condition of the hull and superstructure is sound and good; finish and upkeep excellent. Detailed specifications concerning the floating crane offered under this invitation may be obtained along with bid forms, by application to:

PROCUREMENT OFFICER, PANAMA CANAL COMPANY,
21 WEST ST., NEW YORK 6, N. Y.

British Oil News

By E. Lawson Lomax

Britain's Fuel Problem

Domestic production of coal in the first 24 weeks of this year is more than 2¼ million tons below last year. In 1954 Britain imported three million tons of coal and this year imports are up to one million tons monthly because of increased consumption.

British oil refineries also have been producing smaller quantities of heavy fuels from crude but now are studying means of increasing heavy oil yields.

In view of the possible shortage of suitable coal supplies, the Central Electricity Authority in 1954 entered into a contract with the Esso Petroleum Co. Ltd. for the supply of fuel oil from its Fawley refinery to its new Marchwood Power Station, and news has recently been published that a contract has been made between these two same parties for the supply of 30 million tons of fuel oil to seven electrical power stations over the next ten years. This is probably one of the largest consumer contracts for oil ever signed, and is equivalent to between four and five million tons of deep-mined coal per year, which will reduce the amount required at present to be imported.

To cope with this contract, the Esso Petroleum Co. is extending its refining facilities at Fawley, and also providing more storage and shipping facilities.

Another facet of this increased fuel consumption is that of the manufacture from petroleum of town gas.

In March of this year an agreement was entered into between the British Petroleum Co. and the South Eastern Gas Board to use the latter company's process of catalytic oil gasification in the B. P. Kent refinery, the gas produced being delivered through the present distribution system of the Gas Board.

There is ample evidence to hand that this fuel oil question is having the careful attention of the oil companies and that they are well ahead with their arrangements to deal with future increased demands.

The rationing of coal to domestic consumers will, however, continue, and this is difficult for householders in the south of England, where the ration is small, and probably accounts for the increased use of small fuel oil units in this section.

Middle East Crude Oil Production

The following crude oil production figures for the month of May 1955 are announced:

	MAY 1955 LONG TONS	YEAR 1955 LONG TONS
Iraq Petroleum Co. Ltd. (Kirkuk field)	2,031,337	9,789,455
Basrah Petroleum Co. Ltd. (Zubair & Roumaila fields)	586,587	2,768,077
Mosul Petroleum Co. Ltd. (Ain Zalah and Butmah fields)	105,476	531,323
Qatar Petroleum Co. Ltd. (Dukhan field)	454,263	2,150,317
Kuwait Petroleum Co.	5,060,195	22,748,276
Aramco	3,953,394	19,508,370
Iranian Oil Participants Ltd.	1,168,000	5,462,000

Personnel

W. E. V. Abraham has resigned from the board of The British Petroleum Co. Ltd. and William Eadie has been appointed to fill the resulting vacancy.

Thomas Brookbank, chief engineer at the Shell Haven (Essex) oil refinery of Shell Petroleum Co. Ltd.) has been awarded the O.B.E. in recognition of the part he played in helping to extinguish the fire which occurred there last February 23.

The Queen's commendation for brave conduct goes to H. Dobson and R. A. Jackson of the refinery staff, who assisted Mr. Brookbank in his courageous action.

Council of British Manufacturers of Petroleum Equipment

The C.B.M.P.E. has published its quarterly statement showing a large increase in value of orders for materials and equipment placed in the U.K. by oil companies during the first quarter of the current year. Details of the quarter compared with the last quarter of 1954 follow:

	First Quarter 1955	Fourth Quarter 1954
Geophysical and other exploratory equipment	£ 12,700	£ 1,300
Specialized equipment for oil drilling & production including oil casing, tubing, etc	2,776,500	1,422,600
Specialized equipment for oil refineries, etc. (not including pumps and valves)	1,786,200	1,342,200
Drum & can-making, filling & cleaning equipment, curbside pumps & other other oil metering & dispensing equipment, etc.	312,500	207,400
Railcars, road tankers, aircraft refuellers, etc.	72,000	142,500
Drums, drumsheets and tinplate	2,374,800	1,808,700
Tankage (including tank fittings)	712,200	899,500
Tubulars, pipe fittings and valves (ferrous and non-ferrous)	4,145,400	2,634,000
Pumps (excluding slush, oilwell and curbside)	699,000	364,600
Boilers, boiler house plant and accessories, etc.	74,400	138,200
Electrical equipment—motors, generators, transformers, etc.	1,869,000	1,152,000
Instruments, meters and gauges, etc.	374,300	342,900
Prime movers and compressors	1,963,400	490,200
Machine and hand tools, welding & miscellaneous machinery and stores	1,603,900	1,571,900
Ferrous and non-ferrous plants, sections, sheets and bars	852,400	683,800
Automotive equipment, all types	1,361,100	1,395,100
Laboratory equipment and chemicals including hospital and medical supplies	197,000	194,800
Bulk chemicals, catalysts, barites, etc.	8,704,900	6,119,600
Cement & other building materials & hardware, including timber	1,048,000	882,700
Commissary, general requisites for office, warehouse, household, club and sports, etc.	1,833,800	1,566,000
	£32,773,500	£23,359,000

Comparative figures: For the full year 1954 orders totaled £80,392,200 compared with £67,-124,000 in 1953.

The Council has recently published its 1955-56 catalog of British Manufacturers of Petroleum Equipment, which shows that practically all types of equipment required in the manifold operations of the industry can now be supplied by British manufacturers.

This catalog is very well gotten up, with a comprehensive index, and well printed illustrations of various types of equipment and contains about 100 pages more of informative matter than the last catalog produced in 1953.

Heavy Fuel Oil In Gas Turbines

During the past three years Ruston & Hornsby Ltd., in conjunction with the Esso Petroleum Co. Ltd., have carried out a large amount of experimental work on the use of residual fuel in a gas turbine.

In a preliminary series of tests of the Ruston 3CT gas turbine, a number of 10-hour screening runs were carried out to explore the effect of gas temperature over the range from 620 to 770°C and the benefits to be achieved from using various additives which included magnesium compounds, zinc oxide and ethyl silicate. Magnesium compounds caused a considerable reduction in the corrosion rate without increasing deposition. Since these initial tests, a 1,000-hour test has been carried out on a fuel containing 3.5 percent sulfur, together with 50 ppm vanadium, 26 to 62 sodium and 300 total ash. A magnesium additive was used and the test consisted of ten 100-hour runs. The turbine blading was water washed to remove the small amount of deposit on the blades at the end of each 100-hour run by means of equipment built into the turbine and fed with mains water. No stripping of the turbine was necessary for carrying out the washing process and no other cleaning was required during the 1,000-hour test. The time taken for cleaning was about two hours. About 90 percent of the deposit on the first row of turbine stator blades could be removed in this way and the turbine swallowing capacity was only three percent less at the commencement of the tenth test than at the commencement of the first.

The first five 100-hour tests were carried out at a mean gas temperature of 700°C, corresponding to rather more than 90 percent of full load on the TA gas turbine.

During the next five 100-hour tests the range of temperatures between 650° and 750°C was investigated as well as changes in the additive concentration.

It is now intended to carry out further long tests on the Ruston 3CT gas turbine to determine the commercial possibilities of this system fully and to build up a background of general experience on the operation of gas turbines on residual fuel.

Helicopters In Shell Drilling Operations

The Shell Group and its associates are developing the employment of helicopters in their oil operations, ranging from the carrying of personnel of marine drilling platforms out at sea, to moving heavy machinery in sections up to 1,000 pounds in weight. At Doha in the Persian Gulf, two helicopters built in the U.K. and capable of carrying up to eight passengers in addition to a crew of two are shortly coming into operation in connection with offshore drilling work.

The present drilling location is situated only about five miles offshore in a comparatively sheltered area. So it has been possible to maintain the movement of personnel and supplies by floating craft. Future locations may be as far as 60 to 70 miles out to sea, and in view of frequent spells of adverse weather conditions often encountered in this area, helicopters are the better means of ensuring movement of personnel, light stores and materials in all but the severest weather.

Shell's associate, N. V. Nederlandsche Nieuw Petroleum Maatschappij, has contracted with Bahamas Helicopters Ltd. for the use of two S.55 helicopters for an unusual type of operation in New Guinea.

It is planned to transport a lightweight drilling rig dismantled into sections weighing not more than 1,000 pounds from the main camp to a drilling site some 25 miles away.

When the New Guinea operations are finished, the two helicopters will move to British Borneo for further offshore drilling work similar to that in the Persian Gulf.

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D. McGuffin

McCullough Appointments

Douglas McGuffin has been appointed sales engineer in the Williston Basin area, according to a recent announcement by I. J. McCullough, president of the McCullough Tool Co. of Los Angeles.

Mr. McGuffin joined McCullough in 1954 after spending several years with the Byron Jackson Service Co. working as a sales and service representaative. Prior to his recent promotion, he was in McCullough's service department, gaining necessary experience regarding McCullough services and operating procedures. Mr. McGuffin will be working out of McCullough's Williston, N.D. branch office, under Harry Whittaker, branch manager.

API Elects District Officers

O. A. Graybeal of Sunray Oil Corp. was elected chairman for 1955-56 of the Pacific Coast district, division of production, American Petroleum Institute, at the annual business meeting held during the Spring meeting at the Hotel Statler.

Other officers elected were: H. H. Carrick, Jr., General Petroleum Corp., vice chairman, Los Angeles Basin; Don Sweet, Richfield Oil Corp., vice chairman, coastal area; J. J. Oliphant, General Petroleum Corp., vice chairman, San Joaquin Valley; Irv Dagan, Standard Oil Co. of Calif., Coalinga-Kettleman; Charles T. Reichert, National Supply Co., treasurer; Mrs. Elsie M. Edmiston, API, secretary; Sam Grinsfelder, Union Oil Co., chairman, advisory committee; and John Bell, Humble Oil Co., vice chairman, advisory committee.

Cooper-Bessemer Promotes G. W. Edick

George W. Edick has been named branch manager of compressor and stationary engine sales in New York City for The Cooper-Bessemer Corp., Mount Vernon, Ohio. He will have charge of centrifugal and reciprocating compressors and stationary engine applications in the domestic field throughout the New York area.

G. W. Edick

New Stimulation Method

Dowell, Inc., has developed a new well stimulation technique which combines the penetration of fracturing and the shattering effect of underground explosion. The treatment, on which patents are pending, involves the use of a granular solid explosive which is injected into the formation beyond the well bore in much the same manner as sand in a Sandfrac treatment.

After the solid explosive is forced into the formation it is detonated, causing the formation back from the well bore to be shattered, forming its own propping material to hold open the fractures. With this method of treating a well, it is possible to form much larger pieces of propping material in the fractures than would be possible to inject into the well. This allows larger flow channels through which the well fluids can enter the well more, thus increasing the production.

The "Stratablast" method has been used on more than a dozen oil wells in Eastern Oklahoma, Eastern Kansas and North Texas, with depths ranging from 1,150 to 4,800 feet.

The solid explosive used is reported safe to handle.

Solid explosives have been used in this manner previously. The tests made show that by using a solid explosive, sufficiently large concentrations of it can be forced back in the formation to create an efficient explosion.

Dowell engineers developing this service are Harold Staadt and Parke Muir under the supervision of Dana Hefley, development manager. At the present time all treatments being performed are supervised by these engineers. As soon as the development work is completed, the service will be released to Dowell field enginers for use throughout the oil producing areas of the United States and Canada.

A well in Okmulgee County, Okla. during a Stratablast treatment in the producing sand at a depth of 1,150 feet. The picture was snapped while oil was being blown out of the hole to a height of about 150 feet by the explosion.

Sinclair to Continue Shale Oil Research

Sinclair Research Laboratories, Inc., which has developed a method of recovering oil from oil shale by controlled underground combustion, has announced plans for continuing its experiments on the Colorado project.

The new Sinclair process retorts shale oil in place and the oil is pumped to the surface as in conventional crude oil production. A research crew lived on top of a high plateau near Rifle, Colorado, for the past two summers during the initial experiments.

Joins Cardwell Manufacturing Co.

Philip L. McLaughlin, former drilling editor of *World Oil* magazine, has joined the new product and drilling research department of Cardwell Manufacturing Co., Wichita, Kansas. He will co-ordinate product and drilling research with Cardwell's direct sales organization and the New York export division.

J. W. McCormick

Pacific Pumps Appointee

J. W. McCormick has been appointed New York district manager of Pacific Pumps, Inc., Huntington Park, Calif., it has been announced by A. F. Canada, sales manager for centrifugal pumps. Mr. McCormick, who has been associated with Pacific since 1941, was formerly assistant manager of the firm's centrifugal pump office in New York.

F. F. Elliott Heads Crane Co.

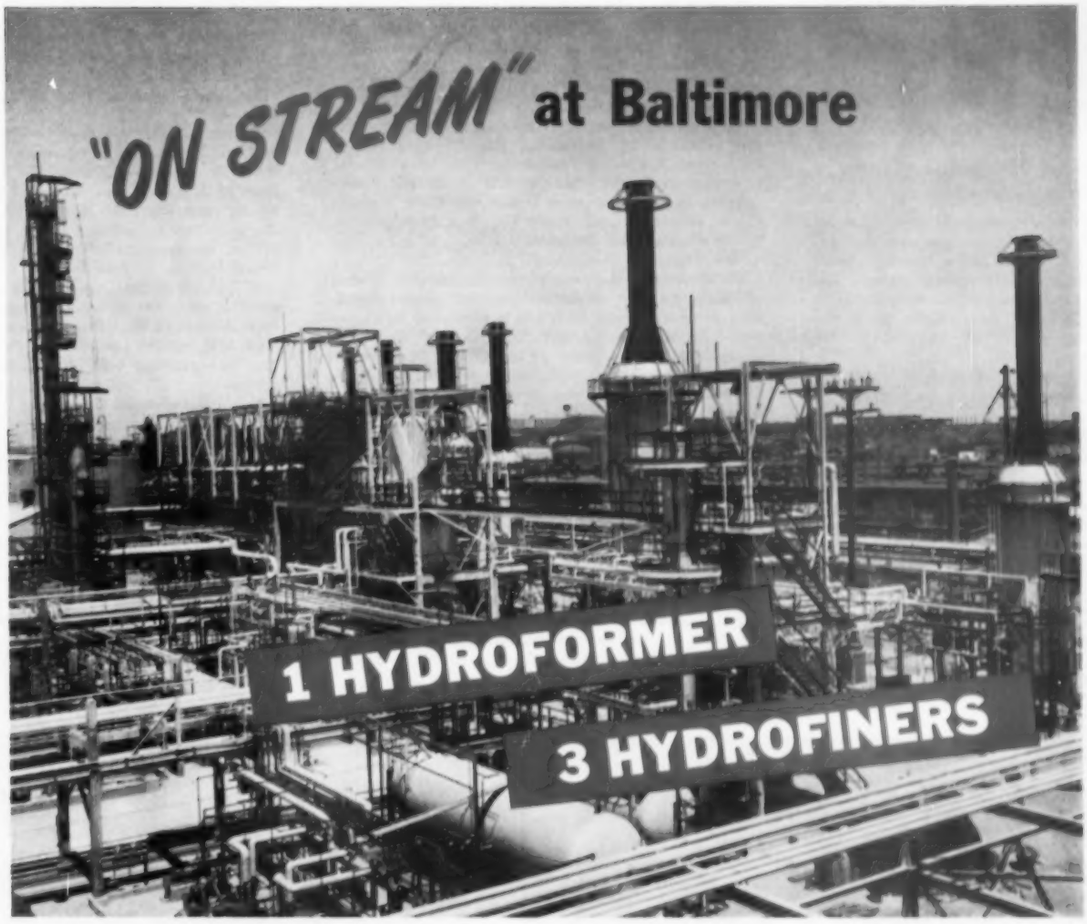
Frank F. Elliott, senior vice president of sales for Crane Co. since 1952, has been elected president and chief executive officer of the company. He succeds John L. Holloway, who resigned as president and director because of ill health.

Coleman Vice President

Stewart P. Coleman, a director of Standard Oil Company (N.J.) since 1946, has been elected a vice president. Mr. Coleman started in the oil business with Humble Oil & Refining Co. in 1920 as a chemical engineer after his graduation from Rice Institute. After advanced study at Massachusetts Institute of Technology where he received his Master's and Doctor's degrees, he headed Humble's technical service and development work. He joined Jersey Standard in 1933 as manufacturing representative on the company's coordination committee, central study and advisory group for Jersey affiliates. When the company formed its coordination and economics department, he became its first manager. He became chairman of the co-ordination committee in 1954.

During the war he was with Petroleum Industry War Council and Petroleum Administration for War as director of the program division. Currently he is a member of the Military Petroleum Advisory Board. He also is chairman of the Foreign Petroleum Supply Committee, a consulting group to the United States government. Last month Mr. Coleman was elected a vice chairman of the National Industrial Conference Board and chairman of its board of trustees.

S. P. Coleman



RECENTLY completed at the Baltimore refinery of the Esso Standard Oil Company are these four new fixed-bed catalytic processing units, — mechanical design and construction by Foster Wheeler.

Two Hydrofiners, each identified by its own direct-fired heater, are shown at the right. One is processing catalytic heating oil and the other, light virgin naphtha. At the center rear is the third Hydrofiner, synchronized with the operation of a fixed-bed Hydroformer which catalytically reforms heavy naphtha to high octane levels.

This is another example of Foster Wheeler's experience in the design and construction of catalytic processing units, both "Fluid" and "Fixed-Bed." For a complete description of this new application of catalysis for desulfurization, quality improvement and octane upgrading, write for your copy of Heat Engineering, July-August 1955. *Foster Wheeler Corporation, 165 Broadway, New York 6, N. Y.*

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H. P. Boncher

W. D. Miller

Shell Chemical Announces New Curing Agent

George W. Huldrum, Jr., general sales manager for Shell Chemical Corp., has announced the development of a new liquid curing agent, Epon[R] Curing Agent Z, for use with epoxy resins. This new curing agent combines the ease of handling of the conventional liquid polyamines with the superior performance properties associated with solid polyamine curing agents.

Curing Agent Z is available in trial lot quantities and a data sheet will be supplied on request.

New National Supply Store and Warehouse

A new store and warehouse building, which also includes the company's district offices, has been opened by The National Supply Co. at Corpus Christi, Texas. The building, which occupies a 1½-acre site, replaces a former store building and separate offices. National Supply has had a store at Corpus Christi since 1936. J. W. Brothers is manager of the store. Victor H. Gardner is district manager of the Corpus Christi district which also includes stores in Alice, Freer, Hebbronville, McAllen, Pearsall, and Victoria, Texas.

Dresser Appoints Two Vice Presidents

H. P. Boncher and W. D. Miller have been appointed operating vice presidents of Dresser Industries, Inc.

Mr. Boncher, who has been general manager of the Dresser manufacturing division since 1942 and a vice president of Dresser Industries, Inc., since 1951, will have operating responsibility for the following Dresser companies: Dresser Manufacturing Division and Bovaird & Seyfang, Bradford, Pa.; Clark Bros. Co., Olean, New York; Dresser-Ideco Co., Columbus, Ohio; Pacific Pumps, Inc., Huntington Park, Calif.; and Roots-Connersville Blower Division, Connersville, Ind.

Mr. Miller, whose previous experience includes ten years in an executive capacity with Creole Petroleum Corp. in Venezuela, will have similar operative responsibilities for the remaining members of the Dresser group: Magnet Cove Barium Corp., Houston; Lane-Wells Co., Los Angeles; Security Engineering Division, Dallas; and Ideco Division, Dallas.

No changes in the present top management of any of these Dresser organizations are contemplated. The company executive heads in each case will continue to direct their own company or divisional operations, but will report to Messrs. Boncher or Miller who in turn will be responsible to J. B. O'Connor, executive vice president of Dresser Industries, Inc. Both Mr. Boncher and Mr. Miller will headquarter at Dresser's general offices in the Republic National Bank Building, Dallas, Texas.

Mary Alexander

Miss Mary Alexander, 38, assistant since 1939 to the late Dr. Gustav Egloff, director of research for Universal Oil Products Co., died June 27 in her Chicago home after a three-week illness.

Miss Alexander was active in local, divisional and national affairs of the American Chemical Society, of which she had been a member for 16 years. She was to have taken office July 1 as secretary of the Chicago Section.

Sun Announces New Gasoline by Closed-Circuit TV

A 30-city, closed-circuit television network was used by Sun Oil Co. to introduce its new gasoline to Sunoco dealers, distributors and their employees on June 22. The hour-long program originated "live" from Station WPTZ, Philadelphia, and was beamed simultaneously to an audience estimated at 14,000 throughout the company's marketing territory. Groups watching the show ranged in number from 500 to 3,000. Later, kinescope prints of the "Advancing with Sun" show will be exhibited in areas which were not reached by the coaxial cable telecast.

Appearing for the first time on big-screen TV in hotel ballrooms, auditoriums and theaters were Sun Oil executives Robert G. Dunlop, president; Fred R. Markley, vice president in charge of marketing; and Clarence H. Thayer, vice president in charge of manufacturing. They presented the story of the development of the company's second new motor fuel in 15 months.

A feature of the telecast was a test car demonstration to show how Sun's new gasoline, called New Advanced Blue Sunoco, compares in performance with leading fuels in the premium-priced field. The Sun product will be sold at regular gasoline prices.

Estimated cost of developing and presenting the show by TV was about $100,000. This compares with a cost of $250,000 last year when the announcement was developed as a road show for presentation to Sun marketing groups. An advantage of the TV presentation was that top management people could take part, an impossibility in the case of the road show method.

The TV script and all plans for presentation were developed in a space of 30 days. Mr. Dunlop and his associates spent the evening prior to the presentation in rehearsal with the result that there was no hitch in the hour-long presentation. Film portions were telecast from New York and the live portion from Philadelphia.

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Industrial Equipment Dept.

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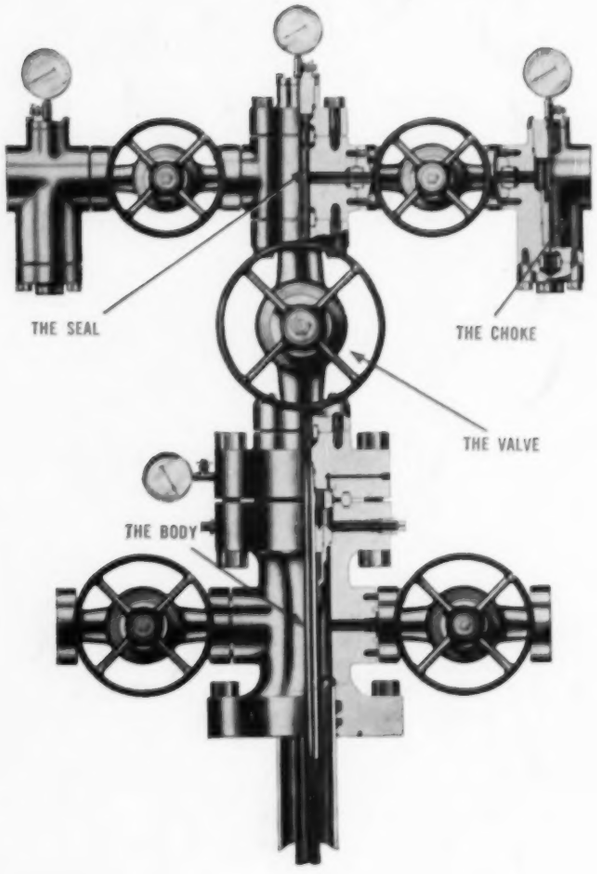

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- *. . . the first and only flow control that gives the advantages of both a choke and a valve*
- *. . . the first dual equipment*

And now, we are proud to announce that Oil Center Tool Company research and development has produced this new high pressure Christmas Tree. Weighed on the scales in relation to its contributions to oil industry equipment progress, Oil Center Tool Company has again taken the lead in serving the industry.

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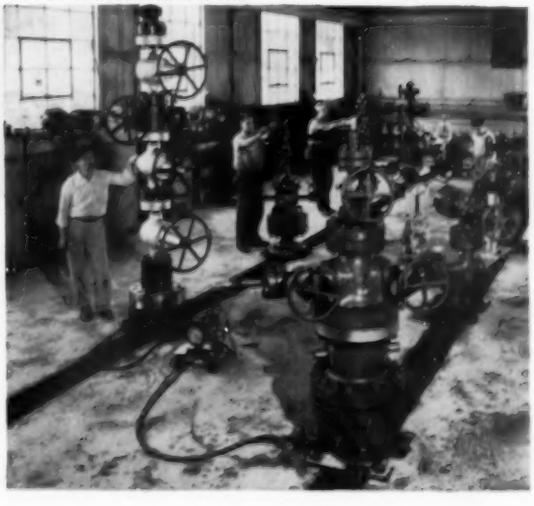

THE BODY All components of the new O-C-T 30,000 lb. test Christmas Tree are machined from carefully selected, special analysis steel. Each component has been tested individually to pressures far in excess of the 30,000 lb. rating of the complete assembly.

THE SEAL The Laurent Float Ring Seal is employed throughout the new O-C-T 30,000 lb. tree, in addition to conventional API Ring Seal gaskets. The Laurent Float Ring . . . proved in hundreds of other applications . . . is now used exclusively by O-C-T and has proven superior to any other tested in this extreme pressure range.

THE VALVE W-K-M'S new high pressure valves, used on the O-C-T 30,000 lb. test Christmas Tree, are designed with a balanced stem to overcome the heavy stem loads inherent to single stem valves. This valve requires much less effort to operate since the force on the handwheel must overcome only the gate drag during operation.

THE CHOKE The choke employed in the design of the new 30,000 lb. test O-C-T Christmas Tree incorporates the standard and proved O-C-T choke beans. They can be furnished with various wear-resistant alloys. The special heavy design choke is provided at this time only with a positive choke. The choke body, however, is designed so that an adjustable choke is interchangeable.

O·C·T

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